AMERICA'S LARGEST TEXTILE MONTHLY

# COTTON

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Volume 47
Number Six
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APRIL, 1923

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## More Nordray Broad Looms Hyatt Equipped

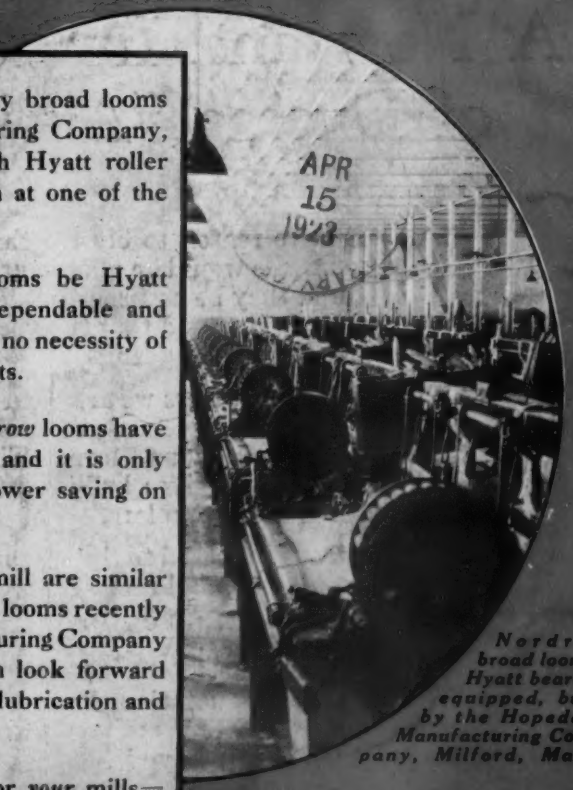
One hundred and one new Nordray broad looms built by the Hopedale Manufacturing Company, Milford, Mass. and equipped with Hyatt roller bearings will soon be in operation at one of the prominent North Carolina mills.

By specifying that these new looms be Hyatt equipped this mill has insured dependable and economical weaving for years with no necessity of bearing adjustments or replacements.

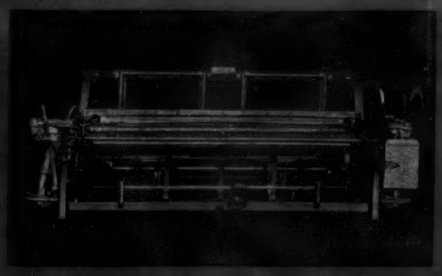
In recent tests Hyatt equipped *narrow* looms have shown a power saving of 23.4% and it is only logical to expect a greater horse-power saving on these *broad* looms.

The new looms in this southern mill are similar to the Hyatt bearing Nordray broad looms recently installed by the Pepperell Manufacturing Company of Biddeford, Me. These mills can look forward to worthwhile savings in power, in lubrication and in maintenance costs.

Secure these weaving economies for *your* mills—specify that your looms be Hyatt equipped.




*Nordray broad looms, Hyatt bearing equipped, built by the Hopedale Manufacturing Company, Milford, Mass.*



HYATT ROLLER BEARING COMPANY

Newark Detroit Chicago San Francisco
Worcester Milwaukee Huntington Minneapolis Philadelphia
Cleveland Pittsburgh Buffalo Indianapolis

# A New and Improved Method of Dyeing "Art" Silk Yarn

WE have reason to believe that there are many mill men who would be glad to use dyed "art" silk yarn, could they be assured that the silk would not be injured in the dyeing and that the yarn could be delivered to them in readily usable form.

To these manufacturers we are pleased to announce the perfection of a patented process of dyeing 150 and 300 dernier "art" silk yarn in wound form. This process does not injure the yarn and gives brilliant, thoroughly penetrated, fast and evenly dyed colors.

And the silk is delivered to the mill on spools or in other convenient wound form all ready for weaving or knitting.

We are prepared to dye "art" silk yarn by this new process either with direct colors, developed colors or vat colors.

When asking for quotations be sure to specify whether you wish us to merely convert the yarn, or to furnish the yarn in the grey, wind it and dye it.

Our yarn department can furnish you every facility for purchasing your yarn requirements through us, if you so desire.

## FRANKLIN PROCESS COMPANY

**Job Dyers of Yarn in Wound Form—Makers of Franklin Dyeing Machines**

**Philadelphia - PROVIDENCE - Manchester, Eng.**

## SOUTHERN FRANKLIN PROCESS CO.

**Greenville, S. C.**

# A LOWER PRICE FOR STANDARD SHUTTLES

Since the advent of the Northrop Loom we have designed and placed on the market more than 2100 kinds of Draper Shuttles to meet the many Spinning and Weaving conditions in various mills.

Improved types, made from a broader experience, have superseded some of the older Shuttles; but many Mills still continue to use Shuttles which have been largely replaced by an improved type.

## STANDARDIZATION MEANS LOWER COST AND IMPROVED SERVICE

Because of the many kinds in use, our Shuttles have, until now, been made "to order." The more general acceptance and increased use of a few types that meet a very large number of conditions has made it possible for us to consider the adoption of a few Standards, of which we propose to carry a ready-made stock. This means better service, prompt deliveries on orders and a saving in cost of production which we are passing along to our customers in the form of Reduced Prices on these Standard Shuttles.

The list of Standard Shuttles already includes three of our most popular numbers. Others will be added from time to time.

LET'S TALK IT OVER. Ask our Salesmen and Experts about these new Standard Shuttles; also about Monthly Order service.

# DRAPER CORPORATION

## HOPEDALE MASSACHUSETTS

SOUTHERN OFFICE ATLANTA GEORGIA

Copyright 1917 by Draper Corporation

# Board Hosiery this Modern Way

A vast number of "Proctor" Automatic Hosiery Boarding Machines are being used by hosiery mills everywhere. The universal experience of these mills is that the "Proctor" saves tremendously against the cost of any other boarding method—and gives the best hosiery finish obtainable from any drying process.

## *Why it Cuts Cost*

The operator boards the stockings but does not strip them. The machine automatically strips the dried stockings from the forms, and lays them into even lots of twelve.

The shaping boards or forms move automatically to the operator in upright position to receive the wet stockings, making easy an output 65% to 100% greater than is possible on any other equipment.

## *Why Best Finish*

The shaping boards or forms are made of aluminum—solid, lastingly smooth, thinner than wooden forms, giving a well-defined crease and smooth press.

The stockings are held against shrinkage while drying, insuring a uniformity of length.

The method of drying is the correct one for fine fabrics—the circulation of moderately warm air, externally applied.

The "Proctor" is built in three types—one for Ladies' Stockings; one for Half Hose; and one adaptable to both Ladies' and Men's Hosiery, as well as Misses' and Children's Stockings. Let us acquaint you.

# PROCTOR & SCHWARTZ, INC.

**DRYING, CARDING, FELTING AND WASTE MACHINERY**

**PHILADELPHIA**

*formerly*

**THE PHILADELPHIA TEXTILE MACH'Y CO.**

*formerly*

**SMITH & FURBUSH MACHINE COMPANY**

Made Under
SKF
Supervision

# The Folly of Throwing Away 72 Percent

ALTHOUGH a shop bought—at a cost of $195.04—815 pounds of lubricant per year for protecting its plain-bearing line-shaft equipment against destructive friction, real protection was never obtained. Despite the fact that the bearings were literally bathed in oil, heavy loads and severe misalignment strains soon caused the oil film to break down, resulting in metal-to-metal contact, the destruction of the bearing linings and considerable wear upon the shafting itself.

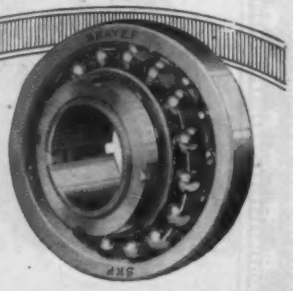
The 86 plain bearing hangers were replaced with Skayef self-aligning ball bearing equipment and it was found that only 198 pounds of lubricant per year at a cost of $29.70 were required. This amounted to a saving of $76.25 or 72 percent in lubrication costs alone. Added to this was a saving of over $900 in power and maintenance, exclusive of the elimination of ruined belts and goods.

The SKF marked self-aligning ball bearings used in Skayef hanger equipment require oil only at infrequent intervals mainly to prevent corrosion and are so housed that the lubricant cannot escape. The inner race is securely fastened to the shafting and is free to turn with the balls and retainer in any direction to compensate for misalignment without the setting up of binding strains which so quickly destroy plain bearings.

May our engineers call and demonstrate to you how ball bearing line-shaft equipment will soon pay for itself many times over?

*Stock-Carrying Agents in All Principal Cities.*

SKAYEF
Self-Aligning
Ball Bearing
HANGERS
(IMPROVED TYPE)



THE SKAYEF BALL BEARING COMPANY
165 Broadway New York City

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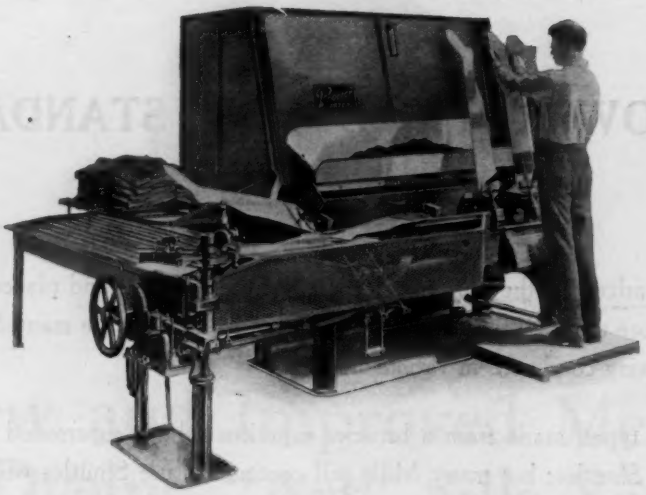

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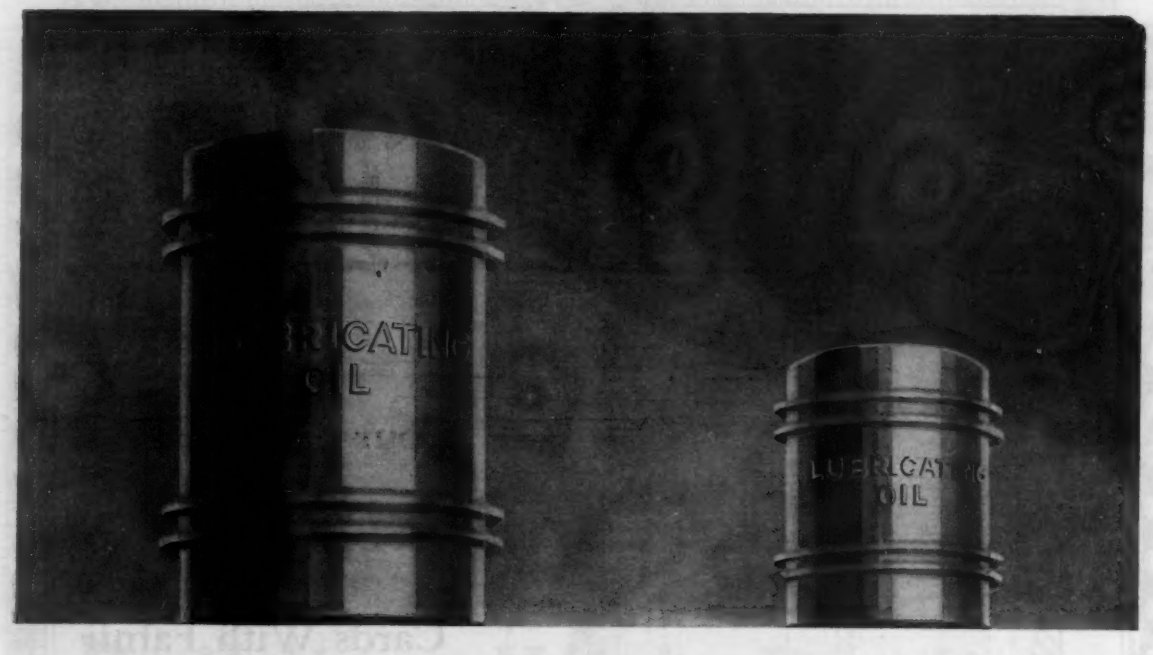


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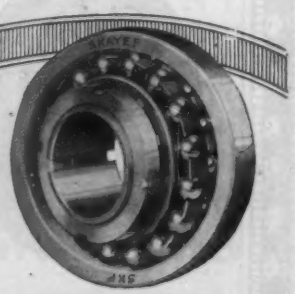
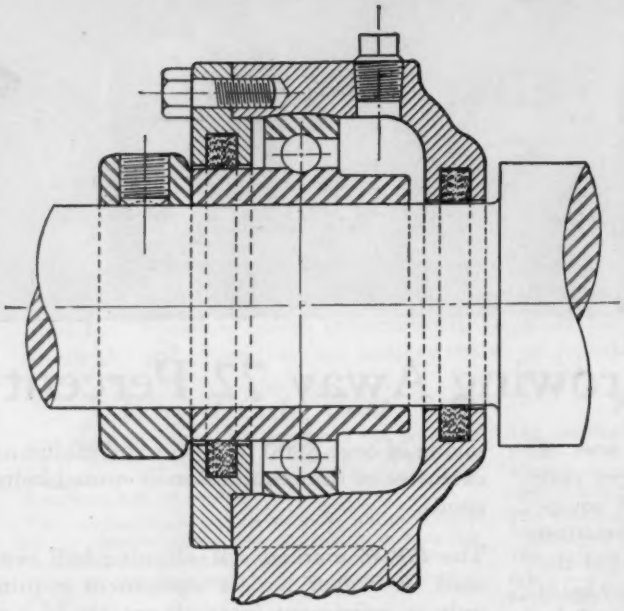


THE SKAYEF BALL BEARING COMPANY
165 Broadway New York City

896

# FAFNIR



## Four Big Reasons for Equipping Your Cards With Fafnir Self-Aligning Ball Bearings.

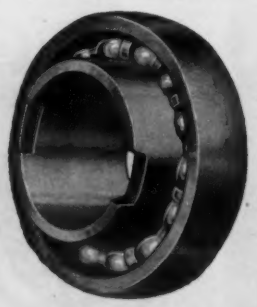
1. **Save Power.** Fafnir Ball Bearings are practically frictionless. By equipping all of your cylinders and licker-ins with Fafnir Ball Bearings, a great power saving is effected.

2. **Cleanliness.** Oil cannot leak out of Fafnir Boxes and ruin the card clothing.

3. **Lubrication.** Three times a year is sufficiently often to oil the bearings.

4. **Closer Setting.** Fafnir Ball Bearings eliminate wear as a factor. Therefore, closer setting of the licker-in can be maintained permanently.

Fafnir Card Boxes are equipped with **Fafnir Self-Aligning Ball Bearings** of the **transmission** type. These bearings are easily installed, there are no delicate adjustments to be made, and no bolts or screws in the housing to work loose.



Fafnir Boxes for cylinders and licker-ins are the simplest and practical and most efficient card bearings made. Write for Fafnir Catalogue of textile applications.

**THE FAFNIR BEARING COMPANY**

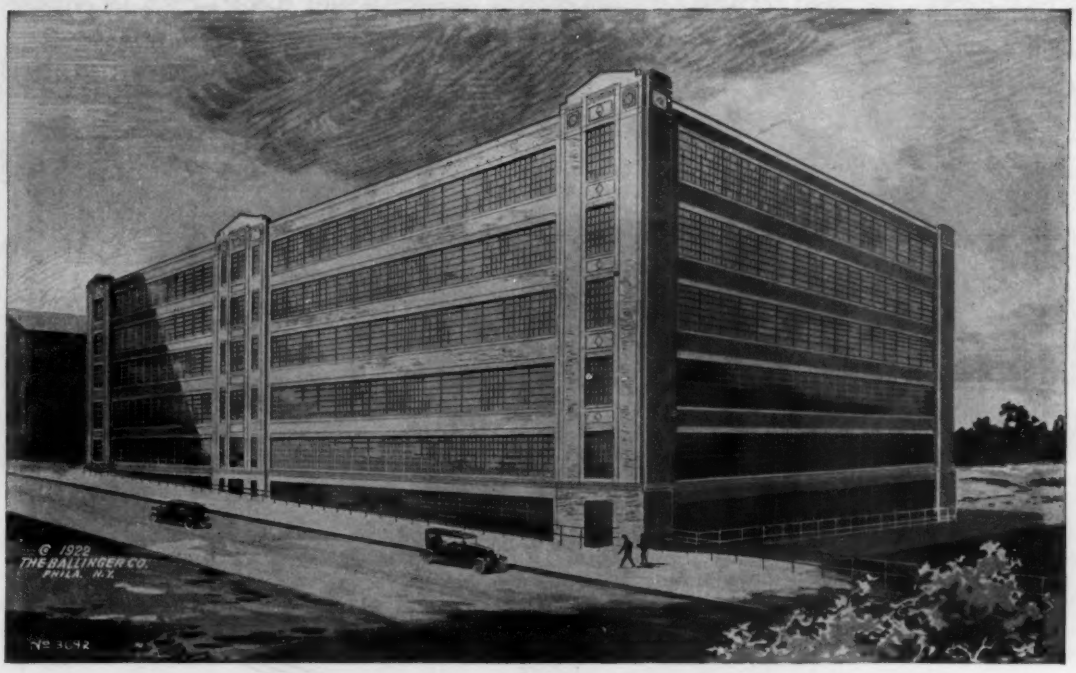
(Conrad Patent Licensee)

**New Britain, Conn.**

**Southern Representatives**

**O. R. S. Pool,**
**Box 1375, Greenville, S. C.**

**S. M. Smith,**
**P. O. Box 1423, Greensboro, N. C.**




**Worsted Yarn Factory, James Lees & Sons Co., Bridgeport, Pa.**
**Architects & Engineers—The Ballinger Company**

# Building With Daylight

Daylight was such an important element in this Worsted Yarn Mill that the exterior columns were omitted to permit an unbroken line of steel windows.

This is the latest step in daylighting textile buildings designed by The Ballinger Company, New York and Philadelphia.

34,500 sq. ft. of Truscon Steel Windows were furnished for this building—Truscon engineers are usually consulted on big problems of natural ventilation and daylighting.

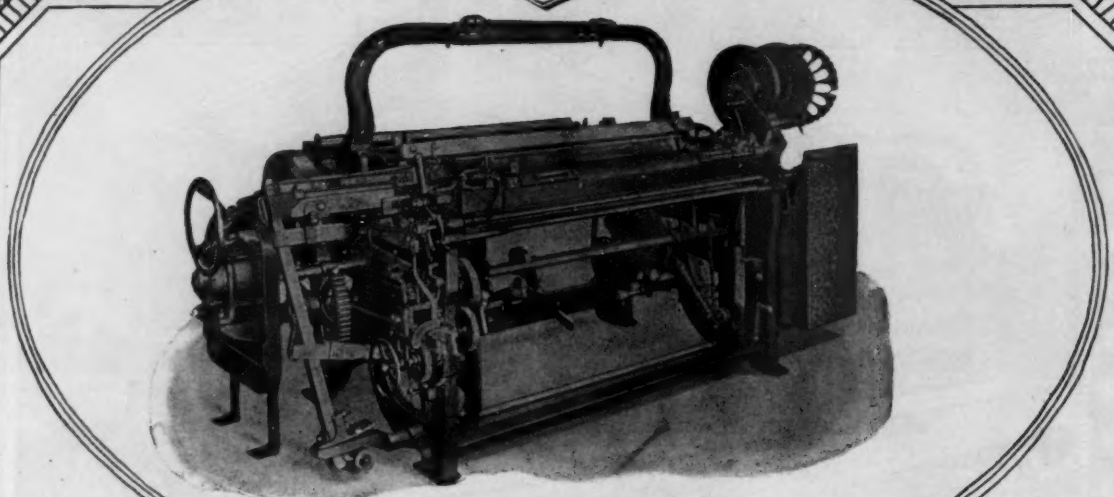
Truscon engineers are at your service at all times to help you make your building a complete success. Back of them is an organization completely equipped to meet every building requirement.

*There are types and designs of Truscon Steel Windows and mechanical operators for every type of building, from the plain factory to the highest class of school or office building.*

**TRUSCON STEEL COMPANY**
**YOUNGSTOWN OHIO**

**Warehouses and Sales Offices in Principal Cities**

**TRUSCON STEEL WINDOWS**




Stafford bobbin-changing plain goods loom.

## *Stafford Looms Increase Production*

We manufacture a complete line of automatic looms, both shuttle and bobbin-changing, for weaving practically every type of fabric that can be made with a single shuttle. ¶ Stafford shuttle-changing looms will handle cop filling just as successfully as bobbin filling. We have a loom for every kind of yarn, coarse or fine, and for practically every variety of fabric, plain or fancy.

# THE STAFFORD COMPANY

WEAVING MACHINERY

**READVILLE, MASS.**

*Branch Office*
**502 Colt Building**
**Paterson, N. J.**

*Southern Agent*
**J. H. Mayes**
**Charlotte, N. C.**

*Canadian Representative*
**Whitehead, Emmans, Limited**
**Montreal**

AUTOMATIC

# STAFFORD

LOOMS

# AUTOMATIC SPOOLER
## WITH
# WEAVERS KNOTTER
# HIGH SPEED WARPER

In Comparison with Ordinary Spooling and Warping

THE BARBER-COLMAN PROCESS

Saves half the employees in the Spooling and Warping Department.

Saves more than half the floor space.

Saves three-quarters of the yarn in process in the Spooling and Warping Department.

Weavers Knots No Spooler Kinks

Fewer ends broken in Warping — Better slashing.

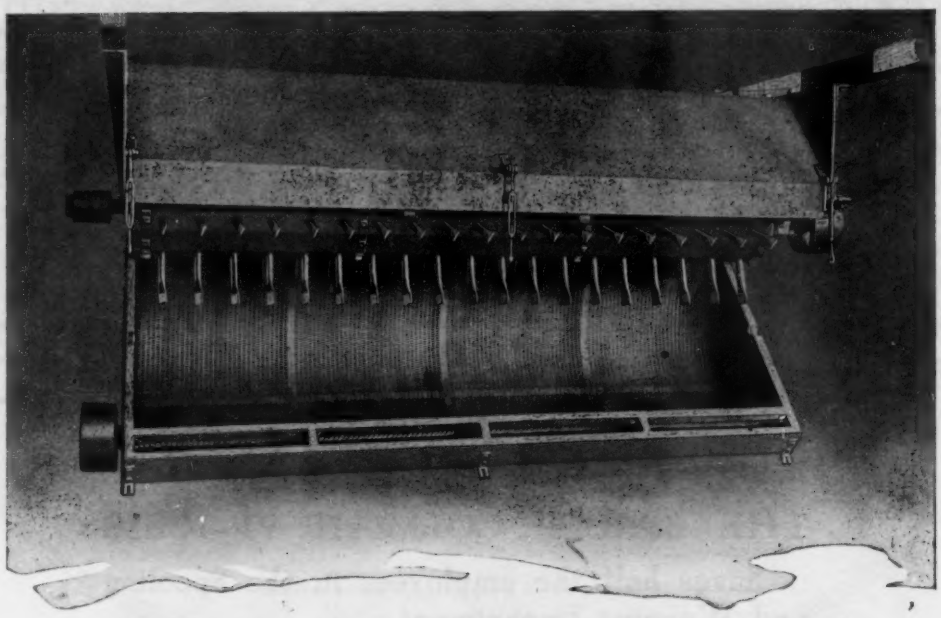
Method of handling yarn insures its being kept clean and protected from damage.

All of which result in BETTER WEAVING and INCREASED LOOM PRODUCTION.

Build for the future. Consider nothing but the best and most modern equipment.

## BARBER-COLMAN COMPANY
ROCKFORD - ILLINOIS

BOSTON, MASS. GREENVILLE, S.C.



# What Do Users Say?

*What They Say* is the best authority on the ability, efficiency and superiority of any piece of machinery. Here's the opinion of just one of the many satisfied and enthusiastic users of the Murray Cotton Cleaning and Aerating Machine:

Mr. N. B. Henry, Ch. Eng.,
The Murray Company, Atlanta, Ga.
Gentlemen:—

We have now been using one of your cotton openers for approximately eight weeks. We have watched its operation carefully and do not hesitate to say that it does more and better work than any other opening device with which we have had any experience. As a supplementary cleaning and opening machine to be used in connection with other standard opening devices it fills a long-felt want. It will be a pleasure to us to show anyone interested in the machine how it operates in our mill at this place. We cannot recommend it too highly.

Yours very truly,
THE AMERICAN TEXTILE CO.,
(Signed) J. A. Miller, President.

The Murray Cotton Cleaning and Aerating Machine thoroughly cleans and aerates the cotton without injuring the fibre. It can be set into the cotton suction pipe between opening room and breaker pickers and hung from the ceiling or other convenient support. No expensive connecting arrangements necessary.

Opening machinery can be speeded up or slowed down to meet requirements of breaker pickers without altering speed of the cleaner. The Murray takes care of itself. It has a working capacity of 25,000 lbs. of cotton in a ten-hour day—more than any other cleaning machine on the market.

Cylinder runs in ball bearings. Every bearing on the Murray is in plain sight.

*Ask for full information today.*

THE MURRAY COMPANY
ATLANTA, GA.

The Murray (PAT. PENDING)
COTTON CLEANING AND AERATING MACHINE

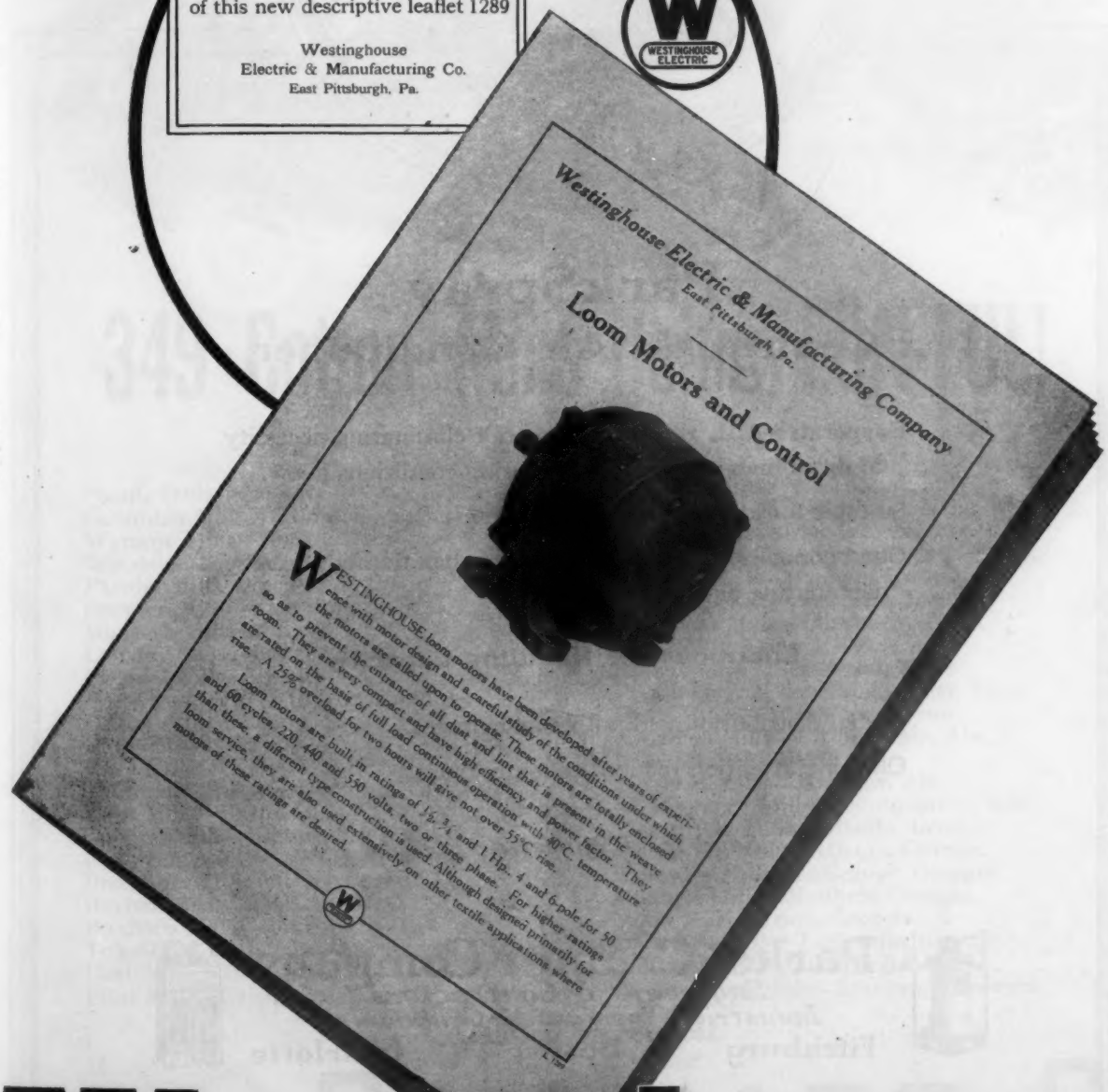
*COTTON WELL OPENED IS HALF SPUN*

# Describes

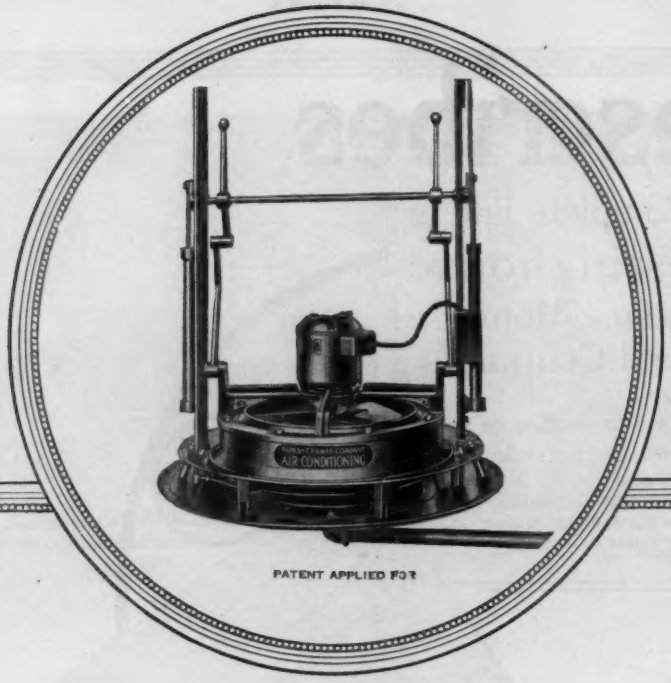
the complete line of
Westinghouse
Loom Motors
and Control

Ask our nearest office for a copy
of this new descriptive leaflet 1289

Westinghouse
Electric & Manufacturing Co.
East Pittsburgh, Pa.


Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.
Loom Motors and Control
WESTINGHOUSE loom motors have been developed after years of experience with motor design and a careful study of the conditions under which the motors are called upon to operate. These motors are totally enclosed so as to prevent the entrance of all dust and lint that is present in the weave room. They are very compact and have high efficiency and power factor. They are rated on the basis of full load continuous operation with 40°C. temperature rise. A 25% overload for two hours will give not over 55°C. rise.
Loom motors are built in ratings of ½, ¾, 1 and 1 Hp., 4 and 6-pole for 50 and 60 cycles, 220, 440 and 550 volts, two or three phase. For higher ratings than these, a different type construction is used. Although designed primarily for loom service, they are also used extensively on other textile applications where motors of these ratings are desired.

# Westinghouse



PATENT APPLIED FOR

# ParkSpray
## Centrifugal Air Conditioner

Evaporates ALL the water fed to it eliminating necessity of drain lines—when manufacturing conditions allow.

Suitable for high or low studded rooms.

Can be mounted directly on column when desired, thereby eliminating pipe lines in room.

**Enormous Air Handling Capacity**

Radial distribution with all its advantages.

Cleaning attention reduced to a minimum.

*Send for Engineer or Booklet*

**Parks-Cramer Company**
*Engineers & Contractors*
*Industrial Piping and Air Conditioning*
**Fitchburg Boston Charlotte**

# THE FUN-FUL LINE

PLAYGROUND EQUIPMENT

## 349 Cotton Mills Using FUN-FUL!

**A few of them**

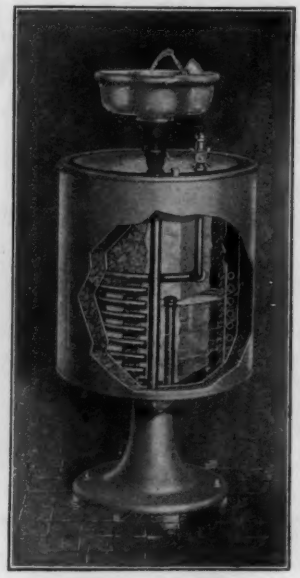
Pacific Mills—Columbia, S. C.
Columbia Mills—Columbia, S. C.
Wymojo Mills—Rockhill, S. C.
Woodside Mills—Greenville, S. C.
Pacolet Mills—Pacolet, S. C.
Drayton Mills—Spartanburg, S. C.
Monarch Mills—Union, S. C.
Langley Mills—Langley, S. C.
Grendel Mills—Greenwood, S. C.
Greenwood Mills—Greenwood, S. C.
Belton Mills—Belton, S. C.
Loray Mills—Gastonia, N. C.
Gray Mills—Gastonia, N. C.
Arlington Mills—Gastonia, N. C.
Flint Mills—Gastonia, N. C.
Cannon Mills—Kannapolis, N. C.
P. H. Hanes Mills—Winston-Salem, N. C.
Proximity Mills—Greensboro, N. C.
Durham Mills—Durham, N. C.
Roxboro Mills—Roxboro, N. C.
Tolar-Hart-Holt Mills—Fayetteville, N. C.
Hart Mills—Tarboro, N. C.
Pilot Mills—Raleigh, N. C.
Cardinal Mills—West Point, Miss.
Lauderdale Mills—Meridian, Miss.
Danville Mills—Danville, Va.
Schoolfield Mills—Schoolfield, Va.
Bonham Mills—Bonham, Texas.
Sherman Mills—Sherman, Texas.
Corsicana Mills—Corsicana, Texas.
Itasca Mills—Itasca, Texas.
Brazo Valley Mills—West, Texas.
Prendergast Mills—Prendergast, Tenn.
Davis Mills—Chattanooga, Tenn.
Avondale Mills—Birmingham, Ala.
Lanett Mills—Lanett, Ala.
Anniston Mills—Anniston, Ala.
Montgomery Mills—Montgomery, Ala.
Fulton Bag Mills—Atlanta, Georgia.
Exposition Mills—Atlanta, Georgia.
Calloway Mills—LaGrange, Georgia.
Moultrie Mills—Moultrie, Georgia.
Trion Mills—Trion, Georgia.
LaFayette Mills—LaFayette, Georgia.
Bibb Mills—Macon, Georgia.
International Mills—LaGrange, Georgia.

**Catalog on request**

# HILL-STANDARD CO.

Anderson, Our 22nd year Indiana

**Perfect Drinking Stream**



**Automatic Stream Control**

No. 570-A

# THE TREMENDOUS COST OF THIRST-QUENCHING

Could you believe that thirst quenching is costing you between $3600.00 and $6000.00 per year for each 200 men?

When men wait, in vain, at a faucet for water to cool, the average time per drink is about three minutes.

---

3 minutes × 6 drinks × 30c per hour = 9c per day per man; 9c × 200 men × 300 days = $5400.00 per year.

---

Halsey Taylor Instantaneous Coolers at frequent intervals throughout your mill will cut the average time per drink to less than one minute, saving several thousand dollars annually.

---

And in addition:—Better working conditions, healthier workmen, less time off for sickness, and increased production.

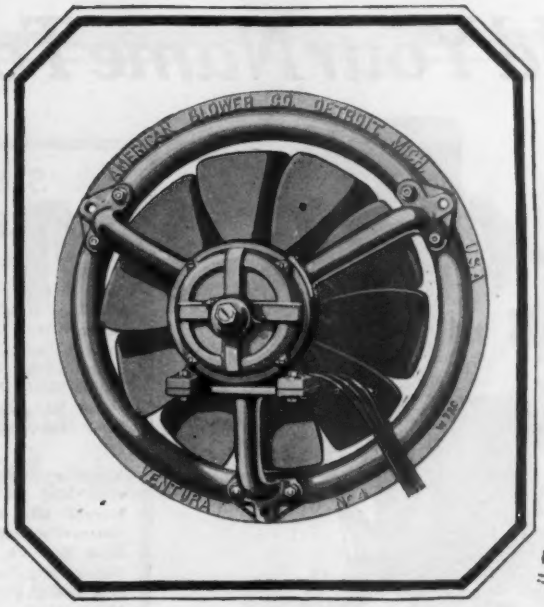
*Write today for new 32-page catalog of drinking fountain fixtures for factories, schools, public buildings, parks, playgrounds, etc.*

**THE HALSEY W. TAYLOR CO., No. 525 Park Ave., Warren, Ohio**

BRANCH OFFICES

New York City 137 East 43rd Street
Philadelphia 5224 Greene Street
Boston 46 Cornhill—Room 512
Chicago 1702 North Talmon Ave.
Kansas City 3838 Troost Avenue
Atlanta, Ga. 322 North Jackson Street
San Francisco 237 Rialto Building

HALSEY TAYLOR



# Prepare Now to Keep Your Plant Cool this Summer

Don't wait until hot weather is here and then wish for cool working conditions.

Get busy now! Those almost unbearable places last year can be made comfortable this year. Your records will tell you where they need ventilation—where you should get rid of that hot, stuffy air.

American Blower Ventilating Fans are made in eight sizes—they are easily installed—operate efficiently and effectively.

Write for interesting data regarding various types of installations and their effect on production.

AMERICAN BLOWER COMPANY, DETROIT
*BRANCH OFFICES IN ALL PRINCIPAL CITIES*
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO

(256)

# American Blower

"Sirocco" TRADE MARK

EXHAUSTERS · VENTILATING FANS · AIR WASHERS · BLOWERS · ENGINES
FOR HEATING, VENTILATING, DRYING, AIR CONDITIONING, MECHANICAL DRAFT

# *Let Us Add Your Name To This List*

OUR service to textile mills is the result of years of experience in installing textile theatre equipment. Our representatives call upon the mills personally, lay out the plans, advise on the proper equipment required and finally supervise the installation and the starting of the theatre. In other words, they take the whole problem off your hands and do not turn over the work to you until the theatre is operating satisfactorily.

The textile industry is demanding the best moving pictures for their employees and that is why they regularly specify POWER'S PROJECTORS.

That is why more Power's Projectors are used by textile mills in the South than all other projectors combined.

We carry a complete line of supply parts and equipment at our various branches. Your orders for supply parts will be filled the same day the order is received. Whatever are your needs for your theatre, we can supply them.

***We have a special offer for Textile Mills. May we present it to you?***

## Satisfied Users of POWER'S PROJECTORS

**ALABAMA**

| | |
|---|---|
| W. A. Handley Mfg. Co. | Roanoke |
| Tallassee Mills | Tallassee |
| Fairfax Mill | Fairfax |
| Avon Mills | Sylacauga |
| Lanett Cotton Mills | Lanett |
| Indian Head Mills | Cordova |
| Selma Mfg. Co. | Selma |
| Buck Creek Cotton Mills | Siluria |

**GEORGIA**

| | |
|---|---|
| Elm City Cotton Mills | LaGrange |
| Bibb Mfg. Co. | Porterdale |
| Roswell Mfg. Co. | Roswell |
| Gainesville Cotton Mill | Gainesville |
| Bibb Mfg. Co. | Columbus |
| Pacolet Mfg. Co. | New Holland |
| Manchester Cotton Mills | Manchester |
| Milstead Mfg. Co. | Milstead |
| Thomaston Cotton Mills | Thomaston |
| Exposition Cotton Mill | Atlanta |
| Habersham Mill | Habersham |
| Trion Company | Trion |
| Union Point Mfg. Co. | Union Point |
| Hillside Cotton Mill | LaGrange |

**NORTH CAROLINA**

| | |
|---|---|
| Durham Hosiery Mills | Durham |
| Pamona Mills | Greensboro |
| Cleveland Mill & Power Co. | Lawndale |
| Rodman-Heath Cotton Mills | Waxhaw |
| Rocky Mount Mills | Rocky Mount |
| Cherokee Falls Mfg. Co. | Cherokee Falls |
| Roxboro Cotton Mills | Roxboro |
| Consolidated Textile Corp. | Burlington |
| Carolina Cotton & Woolen Mills | Spray |
| Erwin Cotton Mills | Duke |
| Cannon Manufacturing Co. | Kannapolis |

**SOUTH CAROLINA**

| | |
|---|---|
| Baldwin Cotton Mills | Chester |
| Tucapau Mills | Tucapau |
| Ware Shoals Mfg. Co. | Ware Shoals |
| Glenn-Lowry Mfg. Co. | Whitmire |
| Monaghan Mills | Greenville |
| Drayton Mills | Spartanburg |
| Victor Mills | Greer |
| Conestee Mills | Conestee |
| Kershaw Cotton Mills | Kershaw |
| Abbeville Cotton Mills | Abbeville |
| Chesnee Mills | Chesnee |
| Union-Buffalo Mills | Buffalo |
| Victor-Monaghan Mills | Seneca |
| Victor-Monaghan Mills | Jonesville |
| Pacolet Mfg. Co. | Pacolet |
| Aragon Mills | Rockhill |
| Graniteville Mfg. Co. | Vaneluse |
| Woodside Cotton Mills | Greenville |
| Orr Cotton Mills | Anderson |
| Issaqueena Mills | Central |
| Clifton Mfg. Co. | Clifton |
| D. E. Converse Co. | Glendale |
| Winnsboro Mills | Winnsboro |
| Monarch Mills | Lockhart |
| Republic Cotton Mills | Great Falls |

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WILLIAM OLDKNOW, President.

100 Walton St.
**ATLANTA, GEORGIA**

THREE TWENTY-EIGHT CALIFORNIA ST.,
OKLAHOMA CITY, OKLA.

Eighteen Fifteen Main St.
**DALLAS, TEXAS**

# MEMO

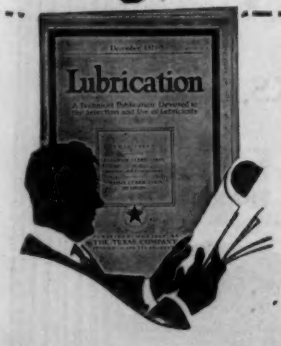
## If we can do *one thing* on this page it's worth what it costs

*And that thing* is to remind you that TEXACO can supply your every oil and grease requirement

[ *There is a Texaco Lubricant for every purpose* ]

**We said we wanted to do *one* thing, but we'll steal a little space for another**

And that is to give you the opportunity of getting our Magazine "Lubrication." This magazine, published by The Texas Company, contains technical, authoritative articles covering the use of lubricants in many industries.
Anyone, whose business or profession guarantees his sustained interest in this important branch of engineering practice, may receive it.
Thus the present list includes: Engineers, mechanical executives, purchasing agents, technical libraries, universities—and YOU, when you reach for your pen or pencil and do the necessary.

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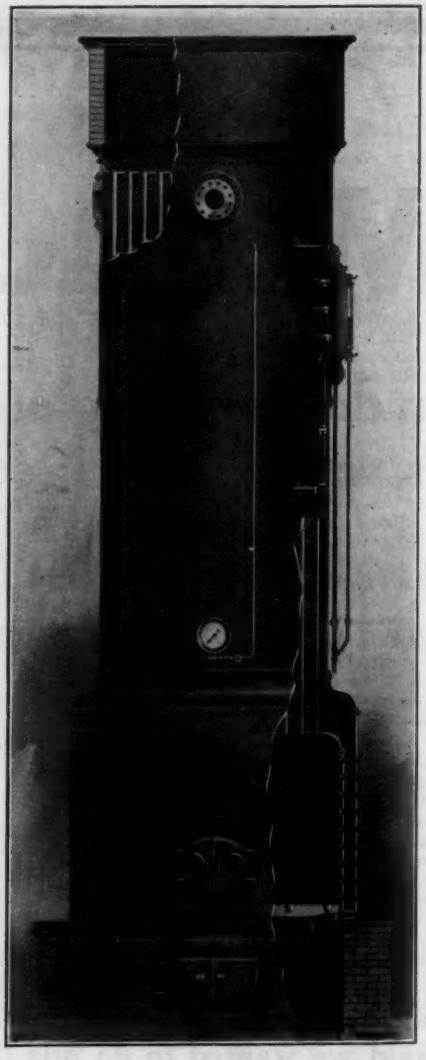
4-23



**Manning Type Vertical Boiler**
**Adapted for Mill Work**

INTERNATIONAL ENGINEERING WORKS, Inc.
FRAMINGHAM, MASS.

**Southern Representative,**
**Isaac Hardeman, Charlotte, N. C.**

**BOSTON**
**PHILADELPHIA**

**NEW YORK**
**SAN FRANCISCO**

# Alabama's Climate

CLIMATIC conditions in Alabama are most advantageous for all kinds of manufacturing, and particularly for textile mills. Variations between highest and lowest temperatures are much less than in other parts of the United States. For instance, at Birmingham, Ala., the highest record is exactly the same as that of Springfield, Mass., whereas the low record of Birmingham is fifteen degrees above the low record of Springfield.

FREEZING temperatures are common to the northern part of Alabama, but the lowest records are rare and of short duration, reducing the cost of fuel for heating and cutting down the expense of winter clothing. Snow and ice blockades on the railroads are unknown, and during the winter of 1922-23 when the north has been battling with such blockades, traffic has moved over southern railways in record-breaking quantities.

**OFFICIAL WEATHER**

**Reported by the U. S. Bureau at Birmingham, Ala., for January, 1923.**

| Day | Max. | Min. |
|---|---|---|
| 1 | 52 | 51 |
| 2 | 56 | 41 |
| 3 | 64 | 42 |
| 4 | 48 | 36 |
| 5 | 57 | 28 |
| 6 | 56 | 40 |
| 7 | 56 | 50 |
| 8 | 64 | 45 |
| 9 | 63 | 45 |
| 10 | 59 | 50 |
| 11 | 58 | 31 |
| 12 | 66 | 40 |
| 13 | 64 | 54 |
| 14 | 64 | 42 |
| 15 | 67 | 54 |
| 16 | 53 | 37 |
| 17 | 54 | 34 |
| 18 | 59 | 34 |
| 19 | 67 | 46 |
| 20 | 56 | 54 |
| 21 | 69 | 52 |
| 22 | 70 | 56 |
| 23 | 50 | 46 |
| 24 | 44 | 43 |
| 25 | 42 | 37 |
| 26 | 52 | 42 |
| 27 | 62 | 42 |
| 28 | 73 | 52 |
| 29 | 64 | 56 |
| 30 | 64 | 43 |
| 31 | 71 | 55 |

Hydro-electric power plants are never shut down by frozen streams and outdoor operations are not hampered by cold and snow. Employees are never snow-bound and unable to get to work on time. Daylight in winter is longer than in the north, reducing lighting expenses.

FREIGHT traffic in Alabama, both rail and water, moves in uninterrupted manner twelve months in the year in Alabama, and with the state's exceptional stores of raw materials, including iron, steel, coal and various other valuable minerals; cotton grown almost at the doors of the mills; abundant hydro-electric power, with ample steam reserves; plentiful native labor, equal in character and ability to the workers in other sections of the country, attractive opportunities are offered for new and branch plants. All desired information furnished upon request.

## ALABAMA POWER CO.

BIRMINGHAM ..... ALABAMA

# Tennessee-The Hea

# The Tennessee E

# Heart of Industrial America

## Stable Labor At Your Command

Tennessee's numerous advantages have resulted in a stability of labor that is unexcelled in any other part of the United States. Ideal climate, good schools, progressive communities and scenic attractions make this section one in which the average worker can live in happiness and comfort.

The vast majority of the population is native born and content to remain in the state. Lower living costs make it possible for labor, both skilled and unskilled, to work for a reasonable wage. Statistics over a long period of years show this territory to be exceptionally free from the troubles and annoyances of labor disturbances. Manufacturers to whom the employment situation is of paramount concern will find the logical location for their new plants in Tennessee, and with the additional advantages that this state offers in the way of unlimited raw materials and adequate electric power industries can be operated with lower costs and increased production.

FIVE ADVANTAGES IN TENNESSEE

1. Ideal climate the entire year.
2. Raw materials of all kinds in abundance.
3. Market facilities — unsurpassed rail and water transportation.
4. Ample supply of intelligent and stable labor.
5. Continuous and reliable electric power at low cost.

*Write us today for further data about Tennessee.*

THE TENNESSEE ELECTRIC POWER CO.
CHATTANOOGA, TENN.

# Electric Power Co-

# PERMANENT WATERPROOFING

***A series of articles by the Technical Staff of the Richardson Research Laboratories, showing what modern science has done to perfect the materials and methods of roof construction***

## No. 1. The chemical requirements of a perfect waterproofing bitumen

Recent scientific investigation in the Richardson Research Laboratories has uncovered facts which put the selection of waterproofing on an entirely new basis. A knowledge of these facts will help you to make your future waterproofing jobs *permanent.*

According to science, there are two basic principles which together constitute the Law of Permanent Waterproofing:

1. **There must be applied between the structure and the source of water a continuous, unbroken layer absolutely impervious to water.**
2. **This unbroken layer must be held in place permanently.**

### *New methods replace the old*

Engineering skill had early developed with satisfactory results, the art of *applying* certain waterproofing systems. But the permanence of these results could never be depended upon.

The reason is this: not enough effort was made to develop the waterproofing agent, the bitumen, to fit its particular job. Even though the most capable architect planned and the best engineer applied a theoretically correct system of waterproofing, both of these men would confess that they knew little or nothing about the actual waterproofing agent, the bitumen. It was as if they had tried to build a perfectly designed dam with mud.

With these facts in mind, the men in the Richardson Research Laboratories concentrated their years of scientific experience in order to solve the problem. The result was a blend of waterproofing bitumen more perfect than had ever been devised.

### *What makes good waterproofing*

This new product, Viskalt, gives you a degree of permanence in waterproofing hitherto unknown. For its constituents are so balanced that, unlike ordinary waterproofing, they hold together in spite of unusually destructive weather attacks.

A glance at the underlying chemistry which led to the discovery of Viskalt will quickly show you why.

In all waterproofing bitumens there are certain essential constituents. Up to a few years ago these were thought to be merely *asphaltenes*, the backbone of the bitumen, and *malthenes*, the water-repellant film. Consequently, all bitumens were considered alike, and no one really knew why, for example, some roofs outlasted others.

But now research has proved that in asphaltic bitumen there are certain other constituents which if not properly proportioned, destroy its waterproofing value. Thus the cause of a leaky roof might chemically be explained as follows:

The newly-discovered constituents are free asphaltous acids and asphaltic anhydrides which, if too plentiful, act upon the asphaltenes and malthenes to produce *carbenes*—the tubercular germ of waterproofing bitumen. These harmful particles break down the waterproofing film and let in the weather.

Many natural asphalts such as lake asphalt, it is now known, contain high percentages of these harmful constituents. Viskalt, on the other hand, is derived from Mexican asphaltums which contain less asphaltic acids and anhydrides than any other commercial asphalt.

In addition, Viskalt has the proper amount of resins (not rosins) combined with the malthenes which give it the required adhesiveness. And the proportion of its asphaltenes lends it remarkable inner stability.

The chemistry of Viskalt then, shows it to be a firm, adhesive waterproofing bitumen, exceptionally free from destructive elements. In other words, it fulfills the first basic requirement of permanent waterproofing—a continuous unbroken layer, absolutely impervious to water. For further facts about these basic principles consult the article for next month.

***Viskalt is made by a firm backed by over fifty years of manufacturing experience. There is a Viskalt preparation for every waterproofing need. For complete specifications just write the Construction Materials Division***

The RICHARDSON COMPANY
Dept. 41 A, Lockland (Cincinnati), Ohio
Melrose Park (Chicago) Illinois, New Orleans, La.

Viskalt
Pliant Under Stress

RICHARDSON Product

*From the makers of Richardson Roofing (including Flex-a-tile Housetops), Viskote, Wallboard and similar products*

# *The Invisible Factor*

A masonry contractor had laid the foundation for a new building and then found the concrete would not set. So far as he knew, the materials were all right, and he had mixed them as he had always mixed them in the past. Yet after days of waiting, the concrete was as soft as the day it was laid.

Later, an investigation disclosed tannic acid in the sand, which prevented the concrete from setting. This was the invisible factor, hidden from the view of the contractor, but revealed under analysis to the eyes of the expert.

*Building With Foresight*

Lockwood-Greene counsel deals not only with the solution of the more tangible problems of engineering and industrial management, but also the **invisible factors**—competition, market conditions, and those intangible values sometimes unknown to the owners themselves. Lockwood, Greene & Co. include in their organization men who have owned and successfully operated industrial enterprises. Our engineers and architects, in cooperation with these men, are able to design and build a plant that is commercially sound from the owner's viewpoint as well as technically correct.

Whether you are building today or a few years from now, **this is the time** to seek Lockwood-Greene counsel. A card or a telephone call will bring you a copy of "Building with Foresight," a booklet descriptive of Lockwood-Greene accomplishments.

## LOCKWOOD, GREENE & CO.

## ENGINEERS

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GEORGE DOWMAN, 610-611 WALTON BLDG., ATLANTA, GA.

*We make a building for every purpose-*

*The largest Sectional Metal Building in the United States*

*The new home of Lyon, Conklin & Co., Inc., Baltimore, Md.*

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*and our buildings last a lifetime!*

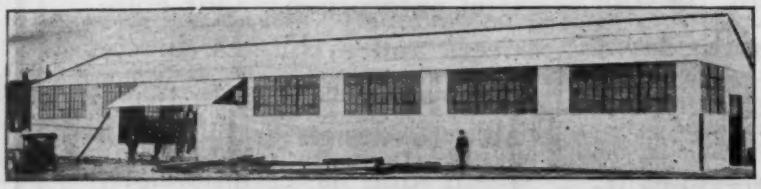
Two examples of our work are illustrated.

Maryland Metal Buildings are fireproof, lightning-proof weather-proof, and are quickly erected by unskilled labor. They are fabricated in standard size interlocking sections; therefore are easily increased or decreased in size after erection. Maryland Metal Buildings are manufactured of No. 24 gauge Lyonore Metal, which resists rust and corrosion, lasting a lifetime. After Maryland Metal Buildings have served their purpose at one location, they may be moved to another, with a salvage of 95%.

Our Engineering Department is at your service. No obligation incurred

*Write Us Today for Catalog!*

*The Phillip-Kell Company Building, Baltimore, Md.*



THE MARYLAND METAL BUILDING PORTABLE YET PERMANENT Lyonore Metal

MARYLAND METAL BUILDING COMPANY

Race & McComas Sts. Baltimore, Md

BOCA SOLID STEEL SASH

SOLID STEEL SASH

*Oakland Southern Distributing Agency*
*Allen E. Walker & Co. Building, Washington, D. C.*

MADE in standard sash sizes for sidewalls and monitors, distinguished by two important features, first, Boca lock-joint which means that our joint is locked rigidly and secure, and, second, the three-point weathering contact at the sides of the ventilators.

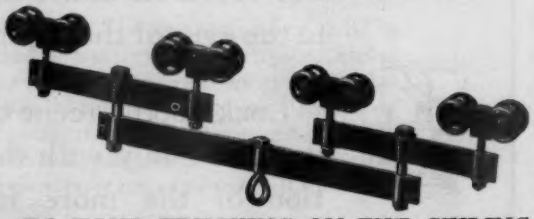
*Full descriptive catalog on request*

**The Bogert & Carlough Co., Inc.**

Paterson, N. J.

WAGNER

OVERHEAD CONVEYING EQUIPMENT IS IDEALLY ADAPTABLE TO COTTON MILL OPERATIONS — CONSERVES LABOR — SAVES TIME AND FLOOR SPACE.



DO YOUR TRUCKING ON THE CEILING AND CONSOLIDATE YOUR CONVEYING AND HOISTING OPERATIONS.

WAGNER EQUIPMENT INCLUDES A COMPLETE LINE OF SWITCHES, CROSSOVERS, CURVES AND CRANES. CARRIERS ARE EQUIPPED WITH HIGH GRADE ROLLER BEARINGS AND CAN BE FURNISHED WITH "HYATT" ROLLER BEARINGS IF DESIRED.

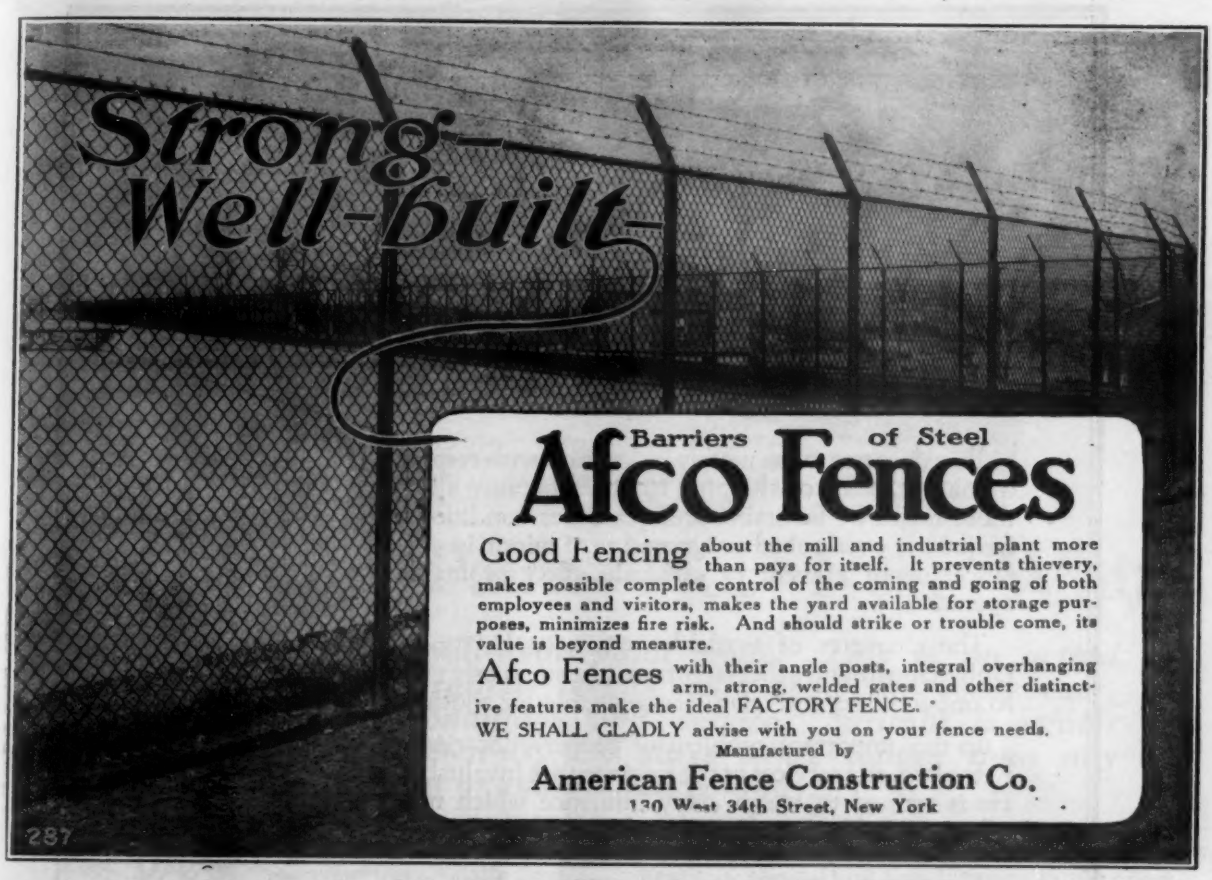
WRITE FOR CATALOGUE.

**WAGNER MANUFACTURING CO**

CEDAR FALLS, IOWA.

GEORGE DOWMAN, 610-611 WALTON BLDG., ATLANTA, GA.

CONTRACTORS AND SALES ENGINEERS


Strong—
Well-built—
Barriers of Steel
Afco Fences
Good Fencing about the mill and industrial plant more than pays for itself. It prevents thievery, makes possible complete control of the coming and going of both employees and visitors, makes the yard available for storage purposes, minimizes fire risk. And should strike or trouble come, its value is beyond measure.
Afco Fences with their angle posts, integral overhanging arm, strong, welded gates and other distinctive features make the ideal FACTORY FENCE.
WE SHALL GLADLY advise with you on your fence needs.
Manufactured by
American Fence Construction Co.
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287

# VARIETY FIRE DOOR CO.

**CHICAGO, ILL.**

*Manufacturers of*

## ALL TYPES OF FIRE PROOF DOORS

in accordance with Underwriters' requirements and bearing their label of approval.

Including the following well-known standard types:

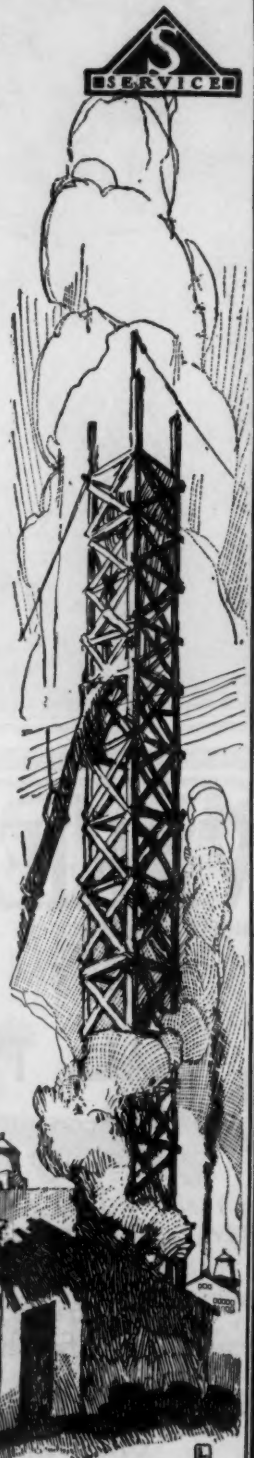
HOLLOW METAL FIRE-PROOF and KAL-O-MINE METAL COVERED FIREPROOF DOORS with standard trims and frames including application of hardware and finished in solid color or grained to match wood, baked on.

SAINO FIRE DOORS—TIN CLAD FIRE DOORS—ROLLING STEEL DOORS—CROSS HORIZONTAL FOLDING DOORS—"VERMANCO" COUNTERBALANCED FREIGHT ELEVATOR DOORS, Etc.

CONTRACTORS AND SALES ENGINEERS

THE FUNCTIONS OF THE ENGINEER

# *To Help Select the Right Location in Which to Establish a New Factory*




THE Commercial success of a manufacturing enterprise—particularly if it is a new or young concern—may hinge upon selection of the right location for the new plant.

This does not mean merely its location with respect to market, labor or shipping facilities, because all of those might be favorable and yet other conditions, frequently overlooked or ignored as of minor importance, might prevent or seriously affect profitable operation.

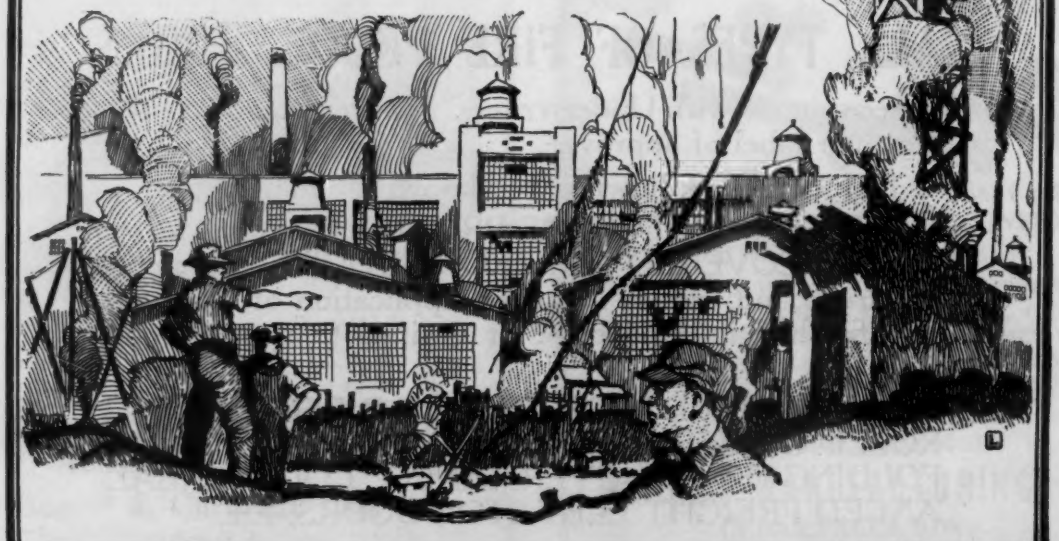
The character of available water supply, topography, climate and other factors may be singularly vital to one industry and relatively negligible for another.

In this important problem of properly locating a new plant, the services of the Engineer are invaluable. He is trained to weigh every influence which may affect profitable operation.

If you are planning to build, someone from our organization will be glad to confer with or assist you.

*Write for a copy of*
**"Factories for the Future"**

**J. E. SIRRINE & COMPANY**
*Engineers*
GREENVILLE SOUTH CAROLINA



*The difference shown in these two photographs—both unretouched—was made by Surlight Paint. Both photographs were taken under exactly similar conditions.*

# Pure White Paint—Not Near White

***Surlight is the whitest mill-white paint made. This is an actual fact open to demonstration—results will show, in every case, that under similar conditions and service, Surlight is whiter when applied, whiter when dry and stays white longer than any paint or enamel you can buy.***

Whenever you need white paint, buy Surlight. Because it is the whitest interior paint made, it has unequaled light-reflecting properties—totally free from blinding glare or dazzle. It provides a soft restful light that makes better working conditions, increases production as much as 8 to 12%, reduces spoilage and prevents a large number of accidents which are due to faulty light conditions.

The white, clean appearance of Surlight promotes sanitation and discourages the common practice of allowing rubbish to accumulate in corners that are usually dark. Dust, dirt and flying particles do not readily adhere to Surlight because it has a hard, smooth surface which is non-porous and does not allow dust and dirt to get a "foothold." It can be frequently washed throughout its long life and its original tone quickly restored.

Surlight is long wearing. It is particularly valuable in mills and factories because it withstands vibrations, shocks and jars incident to the operation of machinery—it does not flake, chip, powder or fall off and spoil cloth in any process of its manufacture.

The extensive covering capacity of Surlight and its unusually good wearing qualities make it the least expensive mill-white paint, considered from any angle—cost per square of surface or cost per year of service.

If you once investigate Surlight you will always use it. We are ready to back any claims we make and invite you to write us for such information as you need—we will gladly mail you a list of Surlight users so you can make your own investigation.

*Write for our DeLuxe book "Surlight"—it tells the story of the whitest mill-white paint made.*
*We also manufacture paints for all uses incident to the operation of textile mills and villages.*

## ST. LOUIS SURFACER & PAINT CO.

4211 Arlington Ave., St. Louis, Mo.

# SURLIGHT

*The Light Reflecting Wall Paint for Industrial Purposes*

## *Distributor Service*

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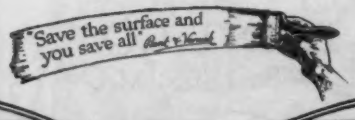



*Norwich, Connecticut, Plant of the J. B. Martin Company*

# First Aid to Daylight

PICTURED above is the J. B. Martin Company's Norwich plant, where quality silk velvet fabrics are produced under ideal working conditions.

Here, nothing has been overlooked that might possibly impair the workers' vision or retard production.

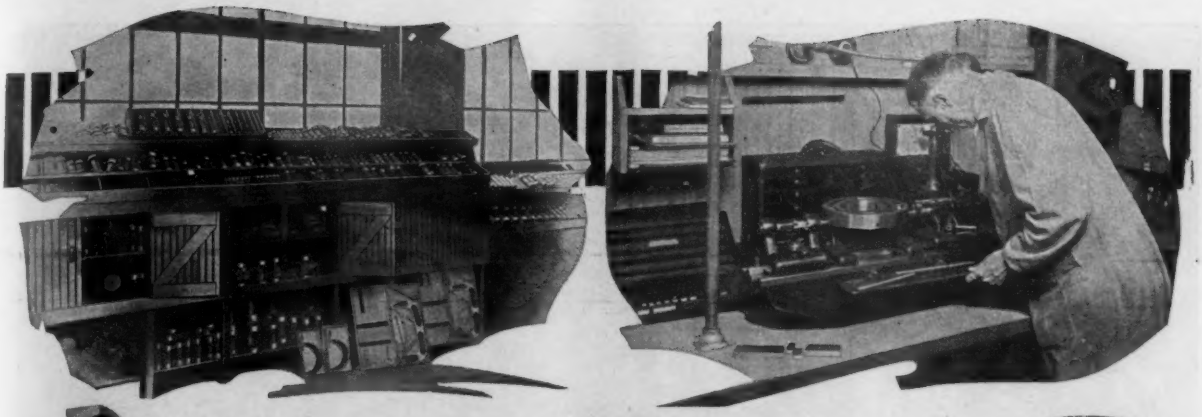
In this, as in the Company's other textile plants at Taftville and Montville, Connecticut, daylight's most effective ally has been enlisted by painting the walls and ceilings with OJACO Mill White.

*The nearest OJACO distributor will gladly furnish complete details concerning OJACO Mill White to anyone interested in improved mill or factory lighting.*

## Oliver Johnson & Co., Inc.

***Paint Makers since 1833***

**PROVIDENCE, R. I.**



# Temperature & Master Gages

That there may be no variation in measurement due to expansion and contraction, the temperature of the glass-enclosed and dust-proof room in which STROM Master Gages are kept is most carefully regulated.

At regular, frequent intervals the shop gages are brought to this test room and compared with the Master Gages and with a standard *comparator* checked to .00001 of an inch. *No variation from laboratory standards is permitted in the STROM output.*

Maintaining accuracy of measurement means maintaining minimum of friction. STROM Ball Bearings as nearly approach perfection in measurement as untiring human watchfulness and constant machine precision can make them. Power flows through them with almost no resistance.

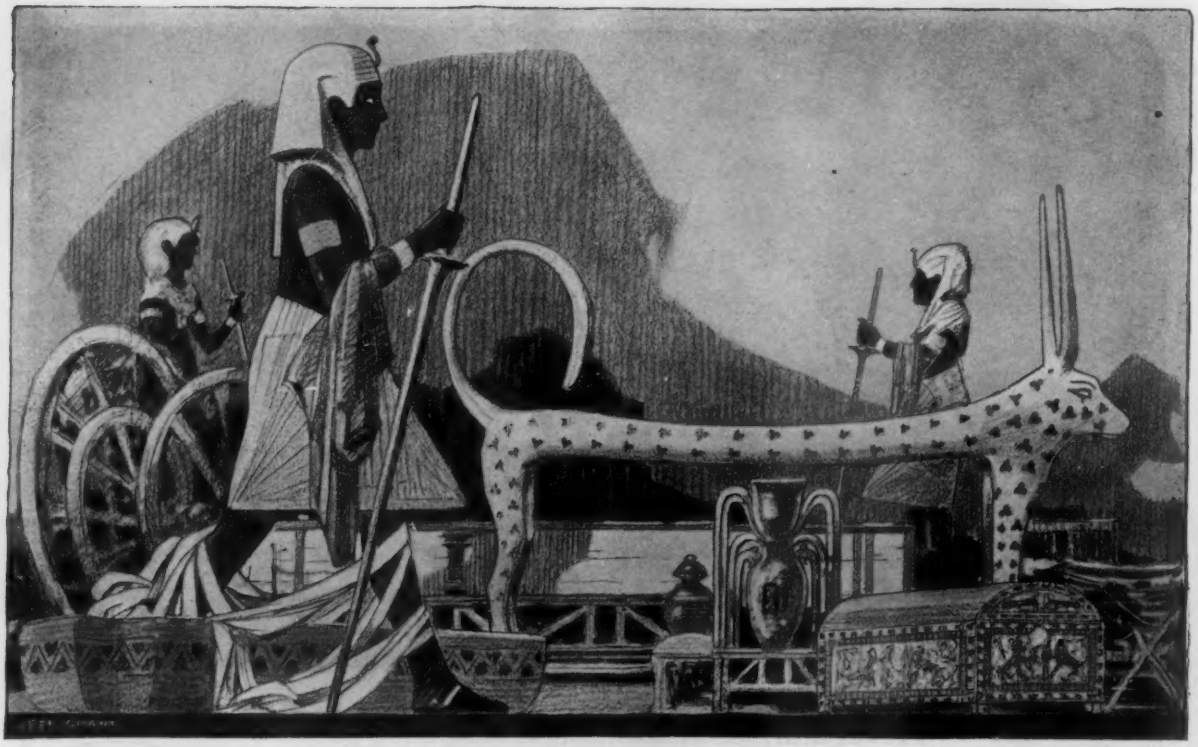
Install STROM guaranteed ball bearings—they save fuel and increase production

*"Wherever a Shaft Turns"*

(1975)

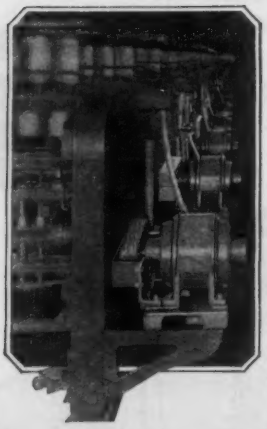
*An Organization Built for Precision*

*Scientific in Principle and Practice*



# A Gang of Steel Huskies

IMAGINE the slumbers of King Tutankhamen broken wide open by the rattle of steel —



The dead dust silence of the Valley of Kings ripped all asunder by pneumatics and steam!

True, both highly unlikely, but they illustrate a point.

A story-a-day for skyscraper gangs is no unusual record. But the Pharaohs thought a Pyramid built in a hundred years was speed.

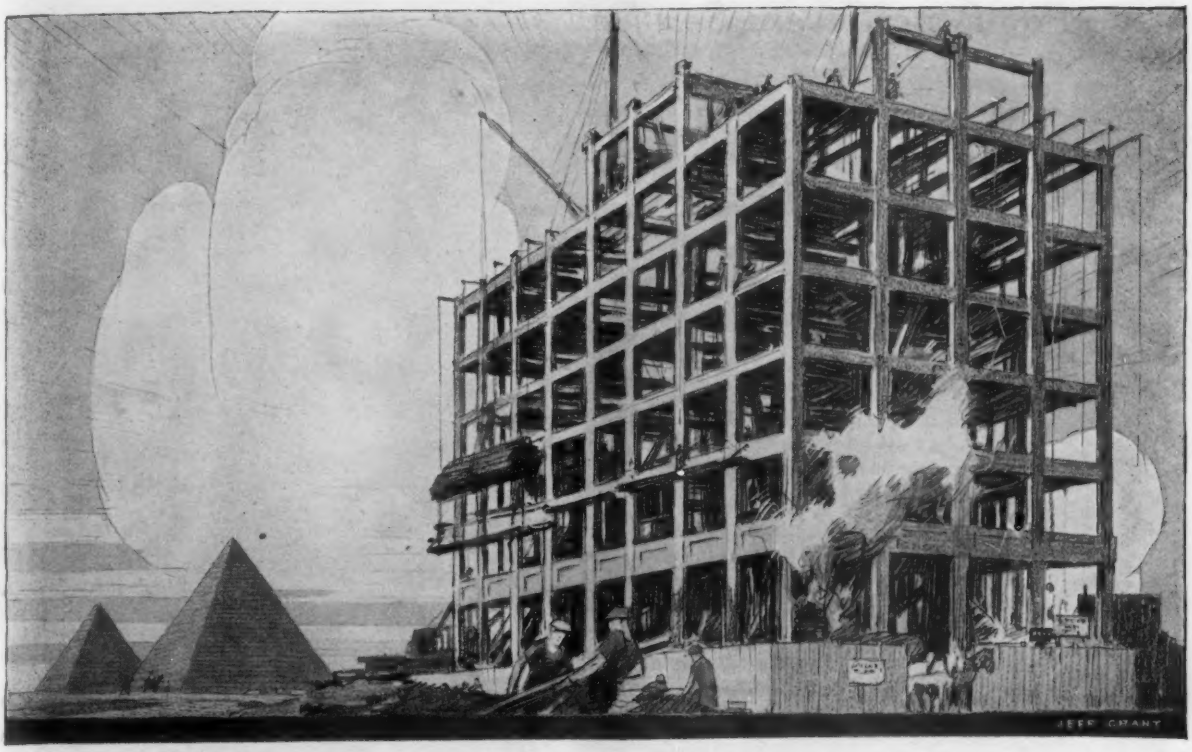
Three hundred decades have made this difference in know-how and tools. Power has been harnessed. Human backs are no longer the best fulcrum.

Yet in our own age there are "Pharaohs" still wasting power.

1225

SILENT

LINK-BELT




# *in the Valley of Kings*

**There still survive some antedeluvian ideas, despite the march of the modern.**

**However, hundreds of plant owners—in a wide range of industries—do agree upon this: Power can be conserved.**

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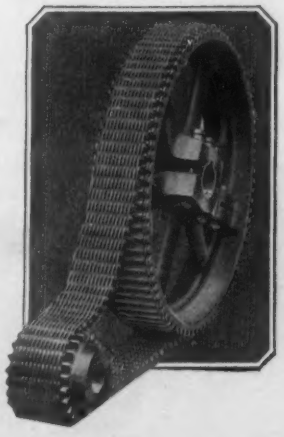

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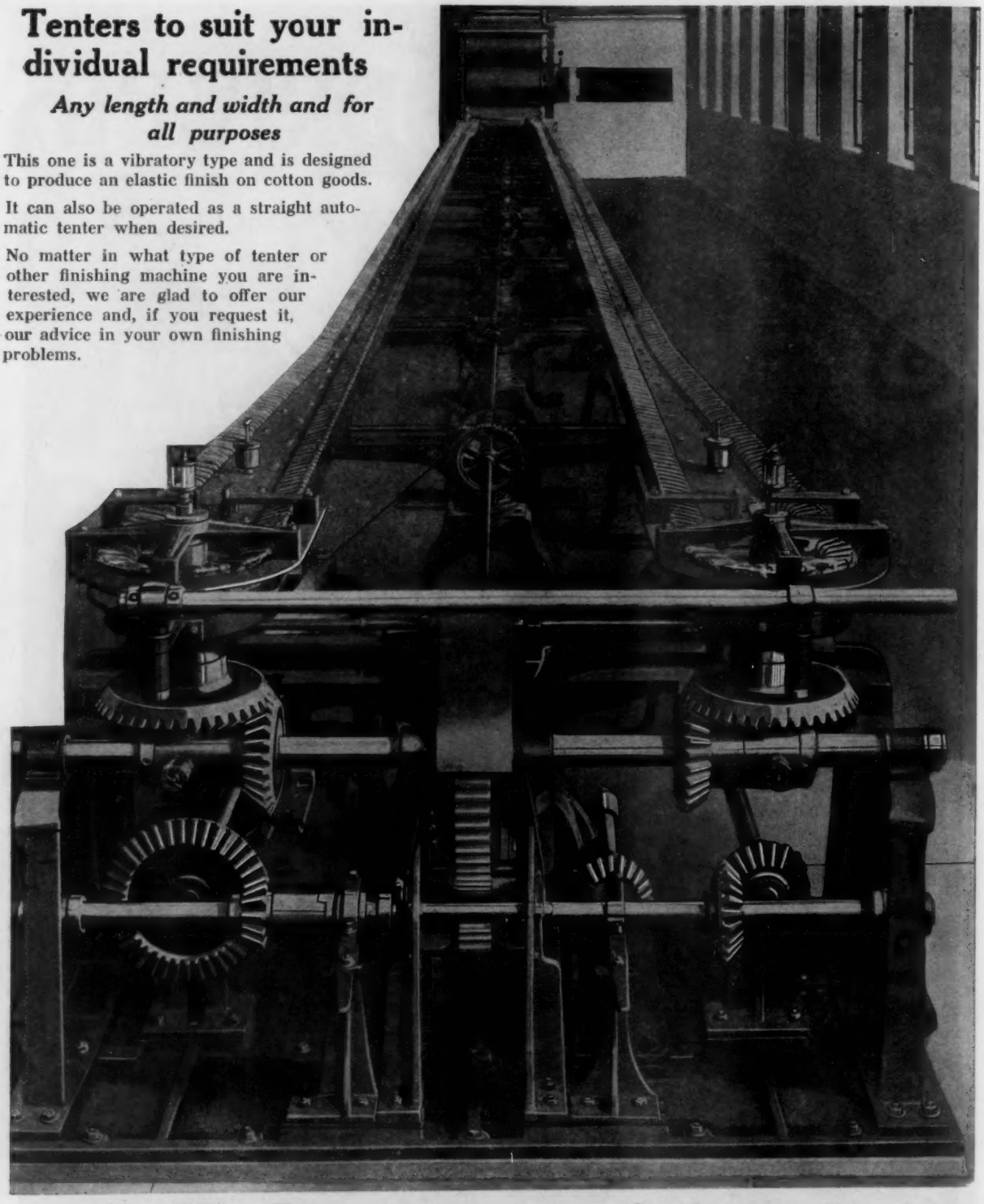

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"These towns are waking up and are breaking away from the peaceful, agricultural life that has long been theirs and are now entering upon a new phase. The factory has come and with it, all the marks of new life. This movement has just begun. We believe it is destined to continue. It looks to us as if the South today is where New England was in 1840, when the cotton mills and other factories began to develop. A young man who wishes to enter business today would do well to look over the South. There he may get in on the ground floor, or as we used to say, he can grow up with the country. That is a great advantage and the last few years have greatly multiplied the chances for the young man from the North or from the West, who goes into the South. The South has become accustomed to these strangers and welcomes them with open arms."—*Babson's Reports. February* 13, 1923. *Special Bulletin.*

In printing the foregoing extracts from Mr. Babson's special bulletin, we wish to add the comment that he must have done much of his earlier traveling in the South in a comfortable Pullman sleeper, otherwise he would never have missed cities of the type of Danville, Greensboro, Concord, Charlotte, Spartanburg and Greenville, that throng the main trunk lines of the railways that serve the South. All the way from Washington and Richmond to New Orleans and Memphis and even west of the Mississippi, will be found thriving cities and towns surrounding the smokestacks of industry, lighted by the power of tumbling waters, fed by the produce of far-flung fields, and connected with the world markets demanding the South's multitudinous products by steel rails and steamships always crowded to the limit of their capacity. Not merely Atlanta and Birmingham, but literally hundreds of other industrial centers great and small deserve to be included.

The people of the South are not the only ones who are "waking up." There are others who are just realizing the opportunities that lie fallow in this sunlit section. We welcome them. We stand ready to serve them. Prosperity awaits them. Thus far Mr. Babson is right.

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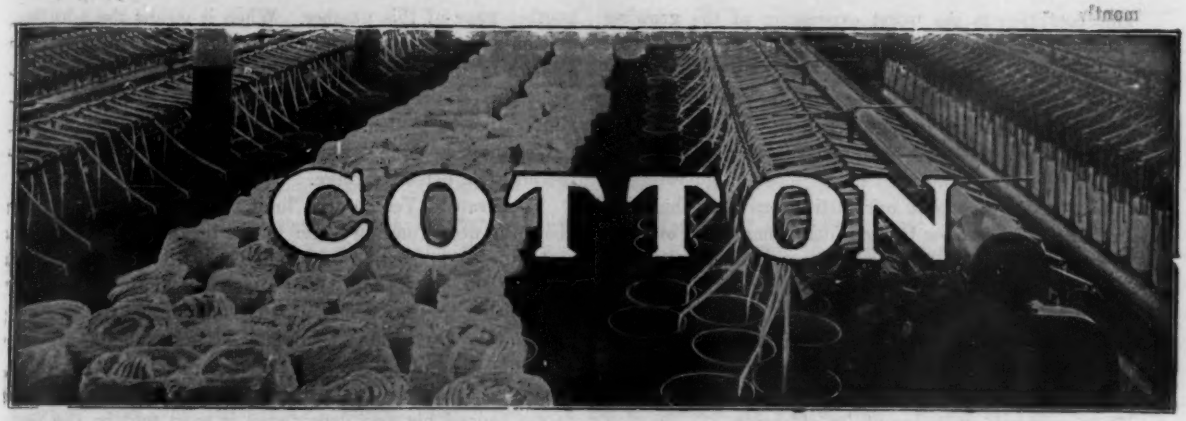



## April, Nineteen-Twenty-Three

### So Much Law That No One Knows What It Is.

"Ignorance of the law is no excuse," is perhaps the best known of legal aphorisms. Yet we are in or approaching the stage in this country where ignorance of the law is inevitable not only among laymen but also among lawyers and jurists who devote their lives to the law's study. A mass of law of such stupendous size and complexity has been created, and is being added to at such an extravagant rate, that it is beyond the humanly possible for virtually anyone to keep up with the requirements of all the statutes. In fact, the enactment of law has been characterized generally during recent years by such helter-skelter methods that trained legal experts now say that in many respects it is impossible for anyone to tell what the law is. The American Law Institute, made up of the best judicial talent in the country, decided recently that it will take a corps of experts at least ten years to clarify the prevailing statutes! And yet the demand for more law was never before insistent as at present. Time alone curbs the statute-making proclivities of law-making bodies, which steadily are introducing into their operations the quantity production methods of efficient manufacturing. Legislators boast, not of the wise legislation enacted or of unwise proposals defeated, but of the per day output of new statutes.

After a little more than one-half of its life, a leader in the Sixty-seventh Congress, for example, declared:

"This Congress has, up to this time, placed upon the statute books 398 laws, of which 311 are public and 87 private. This is at the rate of 1⅓ laws per legislative day of the entire session."

During the full life of the late Congress 476 public and 240 private acts and 97 joint resolutions were passed. This was double the output of the Fifty-Eighth Congress of only eighteen years ago, ten or twelve times the output of the average Congress in which served statesmen like Clay, Calhoun, Webster, or Blaine or Carlisle or the elder Crisp.

But the number of laws passed by the last Congress isn't the worst part of the record. More than 20,000 bills actually were proposed for passage, and it is reasonable to surmise that if time had permitted the bulk of them would have turned into laws. For legislative bodies now to reject a bill is the exception, virtually everything considered is adopted. And if those who want a new law will only press the demand long enough it, sooner or later, will come into existence. Nothing else is more clearly indicated by the legislative record of recent years.

Laws no longer are repealed. If in practice they prove to be unwise, effort is made to inject wisdom into them by amplifying them with amendments which usually make them worse. The notion is abroad that the public man who generally is in opposition to new proposals is necessarily reactionary, that the one who demands that bad laws be repealed instead of being made worse by the addition of more bad law is destructive.

Yet nearly all the statesmen of the past whom history rates as great were generally in opposition; they demanded the repeal of law much more often than they advocated new law. This is true even of the truly great revolutions. The English revolution grew out of opposition to unjust laws enacted by the Stuarts; ours grew out of unjust laws enacted at the instigation of George III. The real results of both were more in the nature of repeal than enactment of laws.

"For 500 years all advance in legislation has been made by repealing laws," wrote Henry Thomas Buckle, one of the great political philosophers, only 75 years ago.

Since he wrote, there probably has been enacted more laws than were written into statute books throughout the world during all the preceding time. And in this modern rampage of law-making, of regarding—in contravention of all the truths of history—the statute as the universal cure-all, we probably have led all other nations. It is now estimated by some students that there are in effect today in these United States not fewer than 1,000,000 solemnly enacted laws. A Congressional committee that has been revising the Federal statutes found that, with all the condensation it could make, more than 5,000,000 words were needed in stating in codified form the outstanding laws of Congress alone. The printed copy of the revised code proposed by that committee weighs nearly twenty pounds, though printed in small type on thin paper. But these are not the most startling features of the story having to do with the committee's work. The revision, though completed nearly two years ago, has not been adopted for the reason that Congress is afraid that after all the proposed new code does not contain all the law as it actually is. And there is virtually no way to find out whether it does so or not.

In the face of such a condition as that, the ancient legal maxim about ignorance of the law being no excuse becomes almost ridiculous.

This condition is the worst expression of the growing cost and exaltation of government as discussed here several months ago. It involves more danger to the liberties of the citizen than does the astounding fact, now being widely commented on, that the average producer—the worker in a factory or on a farm—now has to contribute an average of one day's labor every week to the support of government. It contains more threats to our institutions than the other astounding fact, also now being widely commented on, that the taxes now raised and spent by government of all kinds in these United States provides support for approximately 15,000,000 persons, or practically one out of every seven of the population. They are the beneficiaries, and the dependents of the beneficiaries, of government. The condition is worse even than the elaboration of governmental meddling, which is only one of its offshoots.

This great mass of law calls for enforcement agencies that now touch almost every aspect of life and activity. At the beginning of this century, for example, there were on the payrolls of the Federal government fewer than 300 special deputies, agents and inspectors. Now, it is estimated by careful students, there are more than 30,000 whose prying operations cover veritably everything, from the infant before it is born to the smallest details of yesterday's and tomorrow's simplest transactions of business. And virtually everyone of them is reaching out for, and by every available means that is safe, procuring more power.

And the imponderable volume and inextricable complexity of law tends more and more toward establishing a condition whereby the law is whatever the enforcement agency holds it be. In that, as well as in all its other aspects, there is compelling reason for solemn thought on the part of the citizen and the voter.

## Make Production the Basis.

A contributor in the March number of Cotton, discussing the biggest waste in a cotton mill, answered his own question succinctly by saying, "It is paying for something you do not get. It is paying for 50,000 pounds and then not getting it."

This paying for production that isn't produced is a more common failing than the statement, at first thought, seems to warrant. American employers as well as American employees have been slow to learn that the time wage scale is not a true measure of value for either management or men; that the only sane wage basis for either or both is production.

Where the industrious employee can increase his reward by increasing his production, he has a lucrative and advantageous reason for more faithful and earnest service. And this applies with equal force to the operating executives, where the increased reward of each and all may be attained by cooperative effort.

This further step in the production wage system has already been adopted by several successful mills. Briefly, the plan is to pay the operating executives, including the department heads and, in some instances, their assistants, a certain set standard or minimum wage based on a certain quantity production from the mill. Then, in addition to this, they are paid a certain bonus for increased poundage over the base quantity named.

The result is the almost complete elimination of the condition outlined in the "Modern Fable" to be found upon another page of this number. When it means the addition or non-addition of real money to the weekly or monthly salaries of these men, the question of whether a man is a real tiger for production or only a monkey in disguise is a matter that is settled in very short order. Furthermore, the settling is done within the mill's walls and without the aid of a detective force.

Cooperate! Yes, to the limit. There is no haggling about the work running better in one particular department and setting the machines to produce this result regardless of others. There is no talk about "having the spinner buried" or "waiting for filling boxes." Those men are not making alibis, they are producing poundage—mill poundage, not departmental poundage. It's the mill poundage that pays the bonus, and the operating executive too short sighted to see beyond his own department is soon told by the rest of the team just what kind of a "bum" player he is, and that he isn't a tiger at all. (Read the fable—then you'll get it.)

In several mills where a careful trial has been made of this method of rating salaries on a production basis very successful and satisfactory results have been obtained—satisfactory to the mill and to the men who cooperate. But it should be remembered when studying these results that the mill and its financial head are not responsible for the figures—it's the operating men who are producing the poundage, and any system that will pay them more money for team work will induce cooperation to the limit of each individual's ability.

## Southern Educational Exposition.

A new type of exhibition wil be held in Textile Hall, at Greenville, S. C., from June 11th to 16th, to be known as the Southern Educational Exposition, in which a large percentage of southern mills will be directly interested.

One of the main objects of this show will be the improvement of mill schools. It is planned to have exhibits of all kinds of modern school room equipment, building materials, play ground equipment, and other items associated with the conduct of school work in the mill villages, with a view to pointing out to the mill school teachers and supervisors the latest designs in all of this equipment from the standpoints of efficiency, sanitation, etc.

During the exposition, it is planned, a number of prominent people in school work will speak on the programs of meetings which will be held concurrently with the show, and in these meetings undoubtedly will be much of interest not only to the school teachers themselves but also to the community and social service workers in the mills and villages. William Banks, supervisor of mill schools in South Carolina, who has endorsed the plan, has appointed a committee of prominent mill school workers in the state to cooperate with the committee of Greenville men toward developing a large attendance.

It is well known that the executive management of southern cotton mills generally have ably supported the efforts of their community workers and school teachers, with the result that hundreds of thousands of dollars have been spent in building better schools and equipping them in the most improved manner. The management of Textile Hall feels that during 1923 and 1924 continued expansive development in this direction may be confidently expected, with an expenditure of exceedingly large sums.

# What Do You Know About Labor Turnover?

BY LUTHER H. HODGES, Educational Director.
Carolina Cotton and Woolen Mills Company.

A representative from the Carnegie Institute of Research was recently in Spray, North Carolina, the mill village of Marshall Field & Company of Chicago. During a conversation about labor conditions he asked "What is the percentage of your labor turnover?" The writer, to whom the question was addressed, started to answer the question but on reflection he decided to find out what the Carnegie man knew about labor turnover. So the Research man was asked, "What do you think our turnover would be for a year?" He blandly replied, "I would say, since you are in the textile industry, you go as high as 30 per cent a year." Wonderful simplicity! Suffice it to say the writer was then ashamed to tell his figures which he had felt were quite good.

## Are You as Low as 30 Per Cent?

And this brings us to our main argument. Do you really know what the percentage of your turnover is?

Comparatively few southern textile mills have ever given this great problem any real study. Some know what the phrase means but among the financial and operating executives generally there is no definite knowledge of figuring turnover. A short discussion of the meaning of labor turnover will be given in this article first and then a few facts and figures gleaned from the detailed study of labor turnover records at The Carolina Cotton & Woolen Mills Co. of Spray, N. C., will be offered. This company has complete records on its labor and is rendering a distinct service to its operating executives by furnishing them usable facts and suggestions.

## What Does Labor Turnover Mean?

Uncle Josh would say it means that "it takes a lotta help to run your mill." That is the truth but stated a little more scientifically it may be defined as "the change that occurs when an employee enters and leaves the employ of the firm." Every worker who leaves the employ of the mill for any reason constitutes a part of the labor turnover of that establishment. Another way of explaining labor turnover is to say that "labor turnover is the condition in industry represented by the engagement, loss and replacement of workers." Frankly, this last statement is the best for it is more complete and considers the problems of hiring as well as the actual turnover. It is accepted as true that more time and thought given to the hiring of an employee does away with the vital necessity of working out plans to prevent excessive turnover.

## How Turnover is Figured.

One of the first things that is necessary in an attempt to explain labor turnover for a plant is to know how that plant figures its turnover. It may be figured in one plant in a certain way, and be totally changed in another plant. It is always well to figure out the method used before you try to work out remedies. Also the figures should be gotten over a long period (quarters or years) to be of the very best service and to mean the most to you. In this way, a company can see how its labor turnover fluctuates and can perhaps arrive at some explanation by a thorough study of the figures. Of the comparatively few textile organizations that keep figures, a very small percent of these make a detailed study of their figures. A little later on, an attempt will be made to show how turnover figures can be definitely used.

As has been suggested there are different methods of computing. Some concerns figure turnover on the basis of the number of employees hired while others consider those dropped. The latter method is the more approved one and it is the one we will consider in this article. The turnover figures for the Carolina Cotton & Woolen Mills Co., are made on the basis of those dropped from the employment for any reason whatsoever (except reduction of force) and are not expected to return to work. So in this organization which employs 3,500 workers, it employed during one year about 6,000 people besides its original 3,500 to keep the plants going. This was sometime ago and a turnover percentage of 170 per cent was quite common then. It is much better now, but in 1922 in a mill nearby, that has a so-called "model" village and the things that "attract" employees, the turnover was still above 170 per cent. That figure was inexcusable in 1922, if not in 1919. There were other mills throughout Georgia and the Carolinas which went as high as the one referred to above. They perhaps would have their eyes opened if they had kept accurate figures.

## What Does It Cost?

No attempt will be made to make a definite statement about the cost of labor turnover. Some companies figure $20 a man, others go as high as $1,000, the amount depending on how highly skilled the operation is. The textile plants have a comparatively low actual money cost because their operations and processes are not so highly skilled and the mills being so close to each other, as a rule, enable "floaters" to travel back and forth from one mill to the other. This precludes to some extent the necessity for definite job training but there are other expenses attached to the changing which every mill man understands. One must consider not only the cost of training but also the very high cost of supervision, the cost of damaged goods and low production, the low morale of a changing force and the general inefficiency that results from disgruntled and dissatisfied operatives. A stabilized, home owning (as far as feasible) working force will decrease costs materially and every point reduced in percentage of turnover means dollars saved to the mill.

## Who Causes Turnover?

In many instances the same employee may be hired in the same plant several times within a year and thereby swell the turnover percentage. Although the cost of hiring this employee (who has already been trained for the job) would not be as great as compared to a new man, (who must needs go through a certain apprenticeship before he becomes a part of the regular working force) yet this former employee lessens the efficiency of your organization by leaving. A great number of the employees of the Carolina Cotton & Woolen Co., come from the nearby counties of Virginia with little or no experience and, when trained, make very steady and very good help. But there are a number of operatives who are termed "floaters" who, for-

Name..... Age..... Mill.....

.....

Date of interview..... Date of leaving.....
Above to be filled in at office

**Notice of Employment--Re-employment**

.....was on .....192... ( Employed ( )
(Name of Employee) (Date) ( Re-employed ( )

In..... Plant..... Dept. as..... Rate.....

Last place worked..... as.....

Reason for leaving.....

Remarks, (return from sickness, change of name, address, etc.) .....

.....

Signed..... Approved.....
Foreman Superintendent

1-6-23—3m

Fig. 1. This 4 x 6 Card is Used Whenever a New Employee is Hired. It is also Used for Re-Employment, or for Special Information About Employees, Which Should be Known in the Personnel Office.

FORM P

**INTERVIEW** Date.....

Name..... Local Address.....

Notify, in case of emergency..... Relation.....

Sex..... Color..... Date of birth..... Place of birth.....

Married..... Single..... Widowed..... Divorced..... Separated.....

Dependents..... Partial..... Full..... Relation and condition of dependents; age, health, etc.,

.....

.....

.....

Rent from Co..... Board..... With relatives..... Own home..... Paying for home.....

Member of Organization or Lodge..... Church.....

Extent of education.....

Relatives in employ of this company.....

Condition of health.....

Last vaccinated, for Smallpox..... For Typhoid.....

Special accomplishments, interests, and activities:.....

.....

.....

Remarks:.....

.....

Fig. 2-A. Permanent Record of Employee. This is a Card 13¾ x 8⅝ Inches, Folded in the Center to Give Four Sides. These are Shown at Fig. 2-A, The Interview; Fig. 2-B, The Previous Employment Record; Fig. 2-C, The Employment Record; and Fig. 2-D, The Permanent Record.

2.

**PREVIOUS EMPLOYMENT RECORD**

Previous employment with this company..... Date of first employment.....

(1) In..... Plant..... Dept. as..... Length of service.....

(2) In..... Plant..... Dept. as..... Length of service.....

Reason for leaving: (1).....

(2).....

Two places last employed (1).....

other than with this Co. (2).....

Nature of work (1)..... (2).....

Length of stay (1)..... (2).....

Wages received (1)..... (2).....

Reason for leaving (1)..... (2).....

What other jobs have you held; give name of company, city, occupation, and length of service:

.....

.....

.....

Remarks: .....

.....

.....

Fig. 2-B.

tunately, are in the minority, that give the most trouble when it comes to labor turnover. A detailed study of the records of the Carolina Cotton & Woolen Mills Co., showed that about 34 per cent of the employees had worked for the company less than one year and that 67 per cent of the total turnover occurred with this 34 per cent of the force. These "less than one year" operatives travel from one place to another, or, as one general manager termed it, "live in dress suit cases." They migrate from mill to mill, from mill town to mill town, getting a job here and there, then quitting the job without thought or care and begin their journey again. While they are working in a plant, they delight to boast of the many other mills in which they have worked and the many jobs they have held and, strange to say, they never find the good qualities of a mill or a mill community until they have left it. If you should ask this "floater" why he left such and such a place he lazily remarks—"Oh for no reason at all, I just wanted to make a change." They do, in some instances, say that the town was rotten or the overseer was not worth a hang.

This type of worker does not cause all the turnover, nor does he present all the the turnover problems, but he is a vital part of the whole trouble and incidentally one of the most easily controlled forces. You can keep the floater out if you try.

## Where to Begin.

One cannot intelligently combat this problem, however, until he has the facts. The Carolina Cotton & Woolen Mills Co., have always had certain ideas about their labor problems, but they had to establish an efficient, workable personnel and record system before they began to get results. They had turnover trouble. In one plant there was an excessive turnover in one of the larger departments. The foreman of this department knew something was the matter but he had not found out just what the matter was. On a certain job, the personnel records later showed where the greater part of the room's turnover was occuring. On the cards sent in giving the turnover record, the reasons for leaving were listed and the foreman very soon found out what the trouble was and was able to remedy it. But he was frankly and admittedly in the dark until he knew the facts. When an organization learns where the trouble lies, it can begin to perfect its plans to combat the problem.

The easiest way to get at all these problems, some people say, will doubtless be through a centralized employment department with its attendant plans and problems for research. That opinion, however, is not generally accepted, and an employment department is not a panacea for all employment ills, especially in smaller textile plants or where

3.

## EMPLOYMENT RECORD

Changes in local address (1) ..... (2) .....

(3) ..... (4) .....

Employed ..... by ..... in ..... plant

In ..... Dept. as ..... at ..... per .....

Raise ..... rate ..... raise ..... rate ..... raise ..... rate .....

Transferred ..... to ..... Dept. as ..... reason .....

Transferred ..... to ..... Dept. as ..... reason .....

### TERMINATIONS

| | DATE | | REASON |
|---|---|---|---|
| Resigned | | | |
| Laid Off | | | |
| Discharged | | | |
| Notice | | | |

Remarks: .....

.....

Fig. 2-C.

4.

## PERMANENT RECORD

Quarterly ratings on the basis of 20 per cent for each trait listed:

| | 1920 | | | | 1921 | | | | 1922 | | | | 1923 | | | | 1924 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Date | | | | | | | | | | | | | | | | | | | | |
| Attendance | | | | | | | | | | | | | | | | | | | | |
| Punctuality | | | | | | | | | | | | | | | | | | | | |
| Output | | | | | | | | | | | | | | | | | | | | |
| Quality of Work | | | | | | | | | | | | | | | | | | | | |
| General Deportment | | | | | | | | | | | | | | | | | | | | |
| Total Rating | | | | | | | | | | | | | | | | | | | | |

Accidents:

Date ..... Nature ..... Results ..... Date .....

Date ..... Nature ..... Results ..... Date .....

Remarks and special qualities: .....

.....

.....

.....

Fig. 2-D.

FORM C

**RE-EMPLOYMENT RECORD** Date.....

Name..... Local Address.....

Last employed by this Co. in..... Plant in..... Dept.

Reason for leaving .....

What jobs have you held since (1).....

last employed by this Co. (2).....

Nature of work (1)..... (2).....

Length of Stay (1)..... (2).....

Wages received (1)..... (2).....

Reason for leaving (1)..... (2).....

Reason for returning to this Co. .....

Re-employed..... by..... in..... plant

In..... Dept. as..... at..... per.....

Raise..... rate..... raise..... rate..... raise..... rate.....

Transferred..... to..... Dept. as..... Reason.....

Resigned..... Laid off..... Discharged..... Notice.....

Reason.....

Remarks: .....

Fig. 3. The Re-Employment Record, Which is Slightly Smaller Than, and Fits Inside of the Folded Record Card, Fig. 2.

these plants are widely scattered and different. But the forms and plans described in this particular article can be adopted by any mill, large or small, and if made to function, can be made a real service. The system used by the Carolina Cotton & Woolen Mills Company has been gradually worked out to meet its needs and an endeavor is continually being made to improve the system.

### Every Employee is Interviewed.

When a person applies for work in one of the plants the Personnel Department is called by the superintendent to find out if the person in question has worked in any of the other 12 plants heretofore. If he has, his record is briefly given and the superintendent acts on the information furnished by the Personnel Department. He simply forms his own opinion with due regard to the facts furnished and there is no hard and fast rule for the superintendent and foreman to follow except in certain instances. A complete alphabetical file is kept of all employees who have worked in the mills for several years (the "live" ones being signalled by colored tabs to differentiate from those not then at work).

The foreman puts the person to work, after his record is clear, and then immediately sends to the Personnel Office by regular mill mail their employment card Fig. 1, which is taken by the interviewer (a person trained in that type of work) to the mill within a day or so at the latest and the employment record is taken on the large form shown here as Figs. 2 A, B. C. and D.

During this interview, which takes from 10 to 12 minutes, an opportunity is given to the interviewer, who is thoroughly acquainted with the policies and ideas of the company, to make the employee feel at home and to put across a real message which will bear fruit in the long run, and the record which is gotten is quite complete and can be used to advantage as will be seen later on. Page one of this record (Fig. 2-A) has to do with the so-called personal history of the individual and can be consulted from many different angles. Page two (Fig. 2-B) has to do with the previous employment and gives rather completely the person's previous experience. Page three (Fig. 2-C) is taken up with his local employment record and all future entries are made on this particular page. Page four (Fig. 2-D) is as yet but slightly used, for it is a difficult matter to work out any satisfactory ratings of employees.

When the interview has been completed the employment card Fig. 1 is placed in an alphabetical file which serves as a cross index to the more complete record (noted as Fig. 2) which is consulted by the person who answers the telephone call from the mill superintendent regarding employees. When a person comes back to work for re-employment after leaving the mill, the same type of card (Fig. 1) is sent in, but different blank is used for the interview. This form, which is comparatively brief, fits into the permanent four page card folder (known here as Fig. 2) and is noted as re-employment record blank Fig. 3.

However, it has been decided that a person shall not be

counted in the turnover nor shall he be interviewed again if he has been out sick or has been excused from work for as much as a month. Returns from sickness, change of name, address, etc., are provided for on the same card shown in Fig. 1. A foreman record blank is kept by each foreman showing employees out sick, etc., also those hired or dropped under each date. This keeps the foreman up with his force and enables him to keep the personnel record straight, for he always checks off his list when the card is sent in for any reason whatsoever; whether hired, transferred, raised, dropped, returns from sickness, married, or what not.

*(To Be Concluded Next Month.)*

# The Monkey and the Tiger—A Modern Fable

NOT BY AESOP.

Some years back, before the manufacture of cotton had reached its present high stage of development—ten thousand years ago, or maybe ten million—when man was still a monkey, or maybe a trifle better—it was his custom at favorable moments to sit on the sunny side of a grass patch and conduct biological investigations as to how the one or two survivors of the last flea massacre could, in so short a time, multiply into a couple of regiments—or maybe divisions—all endowed with an active disposition and a militant spirit.

By the time your ancestor—or maybe mine—had reduced his personal population to about the size of a couple of congressional districts—or maybe three—it often happened that he found himself gazing into the bland but hungry countenance of a tiger—or maybe two—regarding him from the bushes with an anticipatory air, whereat he immediately began to pretend to be something which he positively was not. With a quickly snatched handful of mud—or maybe pokeberries—he deftly streaked himself into what he fondly imagined was a good imitation of a tiger and proceeded to wave his tail around in a very tigery manner. Then he went through a lot of motions in the hope that some of them might be the high sign of his prospective diner's lodge, mentioned the large attendance at the last meeting, and meanwhile edged over to the nearest tree from the top of which he could safely apply his thumb to the place his nose would some day grow—if his ruse was successful.

With the passing of the years one by one, or maybe by twos and threes, your progenitor—and mine—lost some of his characteristics, like for instance some of his hair—or maybe all of it—his tail, his fleas—maybe—and his ability to keep one side of his face full of nuts while he chewed with the other, and added some new ones such as noses, wrist watches, and the ability to chew tobacco with one side of his face while he ate peanuts with the other. But he never gained the faculty of looking at himself just as he was. Deep down in his heart he may have known that he was still a monkey, but always he pretended that he was at least something of a tiger; sometimes when it was necessary, but more often when he had merely managed to pick an audience who were willing to pretend that they thought so, too. The ability to look directly at a matter; to say "I am nothing but a monkey caught off my beat, and you are a tiger, but damn it, I can beat you to that tree or make you a good dinner" may come with the millenium—or maybe later—and by then there won't be any cotton mills.

What has all this to do with a cotton mill?

Well, for instance, did you ever ask one of your men if he had done something which you had told him to do but which you knew he had not done? What did he say? Did he say "No sir, I forgot it, but I'll do it right now?" A thousand to one he did not. Being a monkey of forgetfulness—or maybe laziness—he immediately streaks himself with the mud of his imagination—not to use a stronger word—into a tiger of efficiency by saying "Yes sir, I sure did," and then runs and makes an effort to climb the tree of accomplishment before you can check him up, from which vantage point—if he reaches it—he metaphorically applies his thumb—but maybe he doesn't. Let us hope he doesn't. Let us hope that having been caught, or almost caught one time, he forever thereafter keeps such a breeze going through his fur in his passage from one tree to another that the fleas have no chance to catch him on his way, and the sunny spot of "Do it tomorrow" is left for the tiger to roam, in lonesomeness and hunger.

It is quite conceivable that having been fairly caught off his beat our monkey ancestor may have tried to square himself by a variety of excuses and gain immunity or even sympathy by a string of hard luck stories. He may have said that a branch broke and he fell down there and had an awful sprained ankle, Ouch! Or maybe a bigger monkey pushed him off and he wished he could find a good, honest tiger, with a sense of justice, to take his part, he did, so. And what with trees growing bigger every year and tails shorter it had got to the point where a monkey couldn't hardly hold on anyway when the wind blew a bit harder than ordinary. Anyhow, it didn't look exactly right that the tigers could claim all of this sunny spot. Of course there was plenty of sun in the tree tops, but then it did look like monkeys could be allowed the use of this place some anyway, or maybe this side—

No? Well listen to this from a weaver:

"I don't see how you can expect me to make good cloth with that yarn I get from the spinning room. Did you ever look at it? Did you ever see such warps? And the filling! *Good night!*

"Well, any mill man will tell you I can't card and spin the yarn on a set of spoolers. If the feller in the spinning room would make good yarn all them knots and gouts wouldn't be so troublesome. Slack ends on the beams don't spell anything except that the threads ain't all the same diameter. Is that my fault?"

And then the spinner chimes in with—

"Never saw a spinning room yet that was supposed to do any more to the cotton than spin it. If it comes up here uneven how do you suppose I am going to make it any better? You don't see any evener motion on the spinning frames, do you?"

Which moves the carder to declaim—

"What gits me is how you all expect me to take this here dog tail stock and card it into high grade yarn. Every thing I got in here is wore out anyway. Looks like whoever buys cotton would want to do the right thing by me once in a while instead of shovin' me in a lot of waste all the time."

And a little later the dyer declares—

"I can't help it if I missed the color on that set of warps. I ordered the same dye I always have used, and if the top of the barrel gives a color different from the bottom, how do you expect me to know it without I make a dyeing and find out? Send 'em back, I'll make 'em black."

While the mechanic admits—

"Yes, I know that job oughta been done before now, but honest, I haven't got to it. The blacksmith lost his monkey wrench and had to go down town to get another one, and old man Carpenter tore his overalls and was ashamed to go up there where the girls would see him and Mr. Chuck had to get off to buy his boys some school books and—Yes, I know them four men have been on that pipe all day and haven't done much, but that's a hard job. Really there oughta be six men there."

Sounds familiar, doesn't it? Now what I want to know is what are we going to do with such men? Are we going to try to change their nature and make them something else, or are we going to sit calmly by and let nature take its course? Are we going to try to show them the error of their ways and pray for them, with them and at them, and lecture them on the awful consequences of a life of crime, or shall we simply fire them out and let somebody else try them? And if we do, where shall we get any who are better? And if that rule applies all around who do you suppose will hire *us?*

I guess we had better do as the tiger did. He let the monkey climb back up his tree and made out like he hadn't seen him.

In the mean time, are you a tiger or a monkey? Think it over.

Myself, I know I'm one or the other, but can't get it altogether in my head, so I leave it to you. Monk or tige, which?

# Textile Operating Executives of Georgia Hold First Discussion Meeting

The value of practical discussion of mill subjects was effectively demonstrated in Atlanta on Tuesday, March 13th, when the operating executives of the mills of Georgia got together at the first discussion meeting of the Textile Operating Executives of Georgia.

This meeting was held at the Y. M. C. A. building of the Georgia School of Technology in Atlanta, and a representative number of Georgia's superintendents and overseers attended and took part in the discussion. This organization was formed by the Georgia operating executives in September 1922 for the purpose of conducting discussion meetings of the nature of those originated by the Southern Textile Association.

Carding and spinning questions were made the basis of the discussion, most of which was taken from a questionnaire on these subjects sent out by the organization in December. A copy of this questionnaire was published in the January issue of Cotton.

R. W. Jennings, superintendent of the Lanett Cotton Mills, West Point, Ga., who is the general chairman of the discussion organization, presided at the sessions. The practical discussion, which is reported in the following paragraphs, was ably conducted by J. W. Hames, superintendent of the Exposition Cotton Mills, Atlanta, who is the chairman of the organization's carding-spinning committee, under whose direction the questionnaire was compiled and distributed.

The first session of the meeting was opened at 10:20 o'clock Tuesday morning. The opening prayer was made by Robert W. Philip, secretary, after which David Clark, of Charlotte, was called upon for a few words of greeting from the Carolina mill men who have derived much benefit from the discussion meetings held in that section. Mr. Clark recalled the effective results that have come out of the Carolina meetings, and impressed upon the Georgia men the importance of such exchanging of ideas and opinions.

General Chairman Jennings then read from the constitution of the organization an article pointing out its purposes, as follows: "The objects of this organization are the promotion of good fellowship and acquaintance among the operating executives of the textile mills in Georgia; the conduct of practical mill discussion between the mill men, thereby giving an interchange of ideas and experiences among its membership on subjects relating to textile mill operation, and the promotion of such movements as tend to the benefit and advantage of the textile industry and its operatives." Mr. Jennings then urged a wholesome participation in the discussion on the part of everyone present.

The meeting was then turned over to Mr. Hames, chairman of the carding-spinning committee, who declared that "the only way we are going to get any benefit out of this meeting is for everyone to take part in the discussion. We don't want to be backward or bashful about it, there's nobody here but us and we want everybody to talk."

Mr. Hames then took up the questionnaire, first considering the question of opening, and under that head, the subject of the vertical opener. He read the recapitulation of the questionnaires returned in regard to this question, and brought out that out of something over a half a million spindles responding to this question, 264,578 spindles in this number use the vertical or Crighton opener; 35,232 use this opener in triple tandem; 111,878 use it in double tandem; and 117,468 use the opener singly. Grid bars are used in this machine by 145,878 of these spindles, the remainder using the perforated screen.

Discussion on the merits of the vertical or Crighton opener was then asked for by Mr. Hames, and S. Wiseman, superintendent of the Enterprise Manufacturing Company, Augusta, whose 35,232-spindle mill is using the opener in triple tandem on middling cotton, was the first to respond.

"I consider that we derive a great deal of benefit from using the vertical opener in triple tandem," said Mr. Wiseman. "It cleans our work better. We haven't got them

equipped as well as we want them, but we are working to that end now." Mr. Wiseman stated he has grid bars in the first machine, and that "we get out twice as much with the bars on the first machine as with the perforated screen." Referring to the advantages of the opener, he continued that "we find it enables us to do more than we used to do. We have a lot less waste in the picker room and card room. It enables us to reduce our beating in the picker room. We use to beat around 60 but now we have it down to around 38. We like it very much. We believe our spinning is better, and we get a better price for our strips than we ever did before. The vacuum stripper makes it almost clean and eliminates 50 per cent of the foreign matter. We are well pleased with it. We had two in tandem and they did us so much good that we decided to try three. I can just speak for our mill, but I believe our goods are cleaner."

"Do you think you would get better results with the grid bars in the other two machines," asked Chairman Hames.

"Yes," replied Mr. Wiseman, "I know we would, because we can take out as much again motes, etc. The grid bars in the first machine get more than the other two. We get 130 pounds of waste out of the first machine equipped with the grid bars, 72 pounds out of the second and 76 pounds out of the third. We have the grids ordered for the other two machines."

Frank E. Heymer, superintendent, Bradley Manufacturing Company, Columbus, asked what percentage of motes did Mr. Wiseman figure he gets out with the Crighton opener. Mr. Wiseman replied, the results in this respect were very satisfactory.

Referring to the amount of waste taken out, Mr. Jennings asked the amount of cotton being put through the openers. This is about 12,000 pounds a day, said Mr. Wiseman.

"What is the character of the waste being taken out at the vertical openers, Mr. Wiseman?" asked Mr. Hames.

"Dirt, sand, motes, short fibers—all good for nothing else," was the reply. "In other words," continued the discussion chairman, "nothing comes out that could go into the regular work?"

Agreeing to this, Mr. Wiseman continued, "Our cards stay sharper. We have scarcely any sand at the cards."

"What success in eliminating leaf?" asked Mr. Hames. "We have good success," said Mr. Wiseman, "but still we don't get it all out, as you know. But we can just see the quantity that comes out; it's a revelation. Our goods are much whiter."

A man in the audience asked what effect the use of the openers in triple tandem had on the breaking strength. "I don't know whether to attribute it all to the openers or not," replied Mr. Wiseman, "but from 1920, to January 1923, on 24s to 30s, our breaking strength went up eight to ten pounds."

"Do you find that your grid bars throw out more fly than the perforated screen?" asked Mr. Heymer. "A good deal more," was the reply. "Any long fiber?" "No, I have looked very closely and it looks to me like no long fiber comes out at all," answered Mr. Wiseman. He continued by saying that the short fibers have got to come out somewhere in the mill, and his reasoning was that the earlier a man can get them out the better off he is.

Asked if he had a cage section, Mr. Wiseman replied that his arrangement is all connected together, the cotton being distributed after it comes from the opener by carrying it through a five-inch pipe, drawing it up by a fan and then through the regular cage to the distributor over the pickers.

"What speed do you run the beaters?" was asked by Edwin Chandler, overseer of carding, Exposition Cotton Mills. "About 650 r. p. m., in the first, 550 in the second and 450 in the third," was Mr. Wiseman's reply.

"Have you tried opening the grid bars?" was Mr. Chandler's next question. "Yes," replied Mr. Wiseman, "We began at ¼-inch and on up to wide open," adding that "wide open" is what suits best.

Replying to another question, Mr. Wiseman stated that in his opinion, the cotton gets whiter and whiter as it goes from one opener to the next. He continued, replying to a query, that he has a fan running at about 800 r. p. m., to suck the cotton away from the openers.

"What's the size of your dust room?" asked Mr. Chandler. "About as large as this room," said Mr. Wiseman, referring to the meeting hall. "Do you have any trouble with the fly coming out?" continued Mr. Chandler. "Yes, it comes out the chimney," said Mr. Wiseman, "but we don't have any trouble with back draft."

"But you do get cotton out the chimney?" continued Mr. Chandler. "Yes, but it's short staple," said Mr. Wiseman.

Mr. Heymer stated that he had overcome the trouble of back draft by putting an elbow on the down draft fan.

J. A. Sorrells, superintendent, Gainesville Cotton Mills, Gainesville, Ga., said he had worked with vertical openers at the New Holland mill of his company, and that while he had no data on the results, still he knew they took out lots of dirt and trash that used to go to the pickers and cards.

Called upon for a statement with reference to his installation of vertical openers in double tandem, Mr. Chandler of Exposition stated that "we find that we get better results with the double tandem than with the opener used singly, and still better results with the grid bars than with the perforated screen. On the first Crighton we get lots of sand and leaf and dirt that weighs more than what we get out of the second, although the bulk out of the second is greater than in the first. We get mighty good results. Our motes in the picker room are cleaner, and our cards have less to do by using the double tandem opener than we used to have with the single vertical opener."

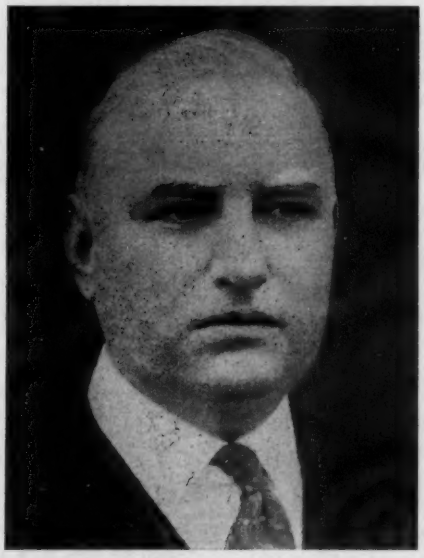
The next man to speak with regard to the benefits derived from the vertical opener was G. A. Franklin, superintendent of the Sibley Manufacturing Company, Augusta, Ga., and a member of the executive committee of the organization. Mr. Franklin is at present using the vertical opener singly, but says he has ordered others so that he can run them in triple tandem. His remarks with regard to the particular advantages derived from the vertical opener were interesting.

"We put in the vertical openers," he said, "first with the screens, and after using the screens a while we found we got about .85 per cent. Then the shops sent me down some grids and we get nearly 1¼ per cent with them; these, however, are not the adjustable kind.

"On the strength of what we are getting on the single vertical opener, we have ordered more and are going to put them in triple tandem, three in a row.

"As I see it, the theory of picking is all wrong, gentlemen," continued Mr. Franklin. "We find that we get more benefit from the opener by being able to reduce the speeds

in the picker room. We get out a lot of foreign matter and dirt and all that, but we are able to go back in the picker room and reduce the beaters from about 58 to 33 beats to the inch. I think on our openers we are getting about 13 beats to the inch, and we find an increase in our breaking strength, and don't get any dirtier cotton, either. In the vertical opener you are beating the cotton in suspension but in the picker you have it fastened down and beat it like the devil. That's wrong. If you do not have the vertical opener to clean it you have to clean it somewhere. You increase the beater speeds and beats to the inch and you are breaking up that leaf into fine particles, pepper and salt—you men know all about that. I suppose you all have it. I think by reducing the beater speeds, the leaf goes to the card in larger particles than it did, and that the card has a better chance to take out a large leaf than a small leaf. We have got the most benefit out of our vertical openers in being able to reduce our beater speeds. I would like to hear from some of the other men on this point; I want to know whether I am right or wrong."



R. W. Jennings, General Chairman.

Mr. Sorrells supplemented Mr. Franklin's remarks with this statement: "When I was using this vertical opener at Pacolet, I reduced the beater speeds in proportion, just as the brother over there did. We did not change the screens, but we reduced the beater speed down and our goods were cleaner and our cards would stay sharp longer."

The question of the use of a dust room in connection with the vertical opener came up, and Mr. Murphy of the Dixie Cotton Mills, La Grange, put this question:

"We have the single vertical opener feeding direct from the bale breaker to the vertical, then directly into the suction pipe for the pickers. We at first planned our opening room down in the warehouses, and our warehouse is flat on the ground so we were having to experiment with putting in the dust room. I would like to know, with the cage section attached to the single vertical opener, if the men think there is more benefit derived from using the cage section without the dust room. I believe with the fans drawing to the pickers that a lot of fly will shake out."

Mr. Hames said they had put in the cage section and at first used two small dust rooms that were 2 x 2 x 15 feet each, one of these rooms taking care of two fans. These two rooms were piped together in the center and exhausted through a stack. They found, however, that they got an excess of dust blown out in the yard, and they had to dig out another room in between these two rooms. This additional space was approximately 12 x 20 x 10 feet. They clean the dust room out every Saturday morning and get quite a lot of short fibers that they would not get otherwise except in the pickers.

"How many openers?" asked Mr. Murphy. "Eight," said Mr. Hames, "two in tandem, four fans."

"How many cubic feet per opener would you figure on?" was Mr. Murphy's next question.

Mr. Heymer stated he might be able to give a little light on that. "I am just installing a new system of Crighton openers," he said. "We had a Crighton opener with self-feed and our cotton was carried from the opener room direct to the picker room with a suction fan. I took this position: that when we sucked the cotton we were bound to suck the leaf, sand etc. When we installed the new system—we have the bale breaker—the cotton is sucked into the condenser direct onto aprons and we have a single Crighton on each side with the cage section. I put a dust room in there— 11 x 9 x 7 feet deep—that, with an exhaust pipe of 30 inches, is ample to take care of the fan. I find—we have had this a week—that in that dust room there is more leaf, sand and short fiber collected.

"The trouble I had first, I discharged it from the down draft fan into the dust room and I pulled it out on top, but I put in the elbow I mentioned and took care of that. We pull our cotton from the cage section. I have two fans from the cage section discharging into the dust room, and there is ample room, but I find a great deal of dust, sand, lint, leaf, and occasionally some motes. On the other hand, when I had the old style system from one Crighton direct into the picker room I found that all the sand and leaf went right through with the cotton. I think the fan right after the Crighton opener is right."

J. W. Hames, Chairman of the Carding-Spinning Committee, Who Conducted the Discussion.

G. R. Brook, superintendent, Mary-Leila Cotton Mills, Greensboro, stated he has a vertical opener in operation, but asked if he were going to attach a cage section would it be necessary to have another cage section upstairs. Mr. Heymer said that he didn't believe it would be necessary, by putting in the cage section with a delivery apron to drop it into a hopper and suck it upstairs. "You won't have any trouble."

Chairman Hames explained that on his installation he has a delivery apron and the pipe comes right down to this delivery apron with a mouth a part of which is under the apron. The suction fan takes it into the picker room. He said this allows any buckles, etc., to drop down as they pass the mouth of the pipe. He related an experience while installing the openers, saying that one of the workers dropped his punch, and after hearing the noise, Mr. Hames said the punch dropped out on his foot.

At this point C. R. Brown, superintendent of the American Textile Company, Ateo, Ga., described a different type of opening machine which he helped design. Instead of being a vertical opener, he said, this is a strictly horizontal proposition. This machine, which was described fully in the October 1922 issue of Cotton, consists of a cylindrical perforated screen inside of which is a series of arms or beaters. The device is connected directly in the cotton pipe, and as the cotton passes through, the foreign matter is knocked down through the screen by these arms into a channel which has in it a screw conveyor which pushes the waste out of one end of the machine. Mr. Brown was very enthusiastic over the results attained. He stated it as his opinion that it will do the work of three vertical machines, saying it has a capacity of 30,000 pounds of cotton per day. A 3-horsepower motor will operate it, he said. The beaters revolve at a speed of 400 to 600 revolutions per minute. He is using this on middling cotton, and "you will send more dust to the dust room than by any other system I have ever seen." Mr. Brown stated he would be glad to show the machine to anyone who would come to Ateo.

A. E. Massey, superintendent, Thomaston Cotton Mills, Thomaston, reported he had found it necessary to dispense with the regular Crighton opener on 1¼-inch cotton because he said it would twist it, and that he was very much interested in a machine that would clean this work.

"I would like to know if anyone using a bale breaker on good middling cotton has installed the Crighton opener on this work, and if so to what advantage," requested C. R. Brumby, Jr., superintendent, Cedartown Cotton & Export Co. "We are making high class hosiery yarns. We haven't any Crighton opener, but we do have the bale breaker, and I would like to know if anyone has installed the Crighton opener on that class of work."

It seemed to be the consensus of opinion that Mr. Brumby was the only man in the house using good middling cotton.

W. O. Tallent, superintendent, Adams Cotton Mill, Macon, stated he had examined the machine described by Mr. Brown, and "I have never seen so much trash as that machine takes out."

The next question to be discussed was "What method have you for mixing roving and scavenger waste back into the regular stock?"

Mr. Murphy of La Grange described his method, prefacing his description by saying that he had had lots of trouble with the regular opening man feeding in too much. "As long as you are there," he said, "he will feed it all right, but when you're gone he will put in big lumps." He then described the means he had adopted for overcoming this, by putting an apron on the end of the waste machine, the cotton passing over this apron into the hopper. The cotton goes from this directly into the suction pipe that feeds onto the distributor apron about forty feet from the condenser. This system, he said, gives an even feed of the waste.

Regarding the possibility of fire, Mr. Murphy said that with this arrangement it is possible in a second's time to disconnect the apron from the hopper and prevent fire; if the fire should get to the hopper a trap door is knocked down which shuts off the fire.

J. Wheeler Mears, Sr., superintendent, Monroe Cotton Mills, described his system which he said is similar to that of Mr. Murphy. He distributes his waste behind the condenser and thereby, he pointed out, gets an even mixture of the waste with the regular run of cotton.

Mr. Sorrells said "We are not blessed with the machine but we do have a Kirschner beater for mixing our roving waste." He explained the system he uses as a precaution against fire in his hopper of having fuse links connected by cords to weights which shut off the fire in case there

should be any.

C. A. Sweet, superintendent, Fairfax Mill, West Point, said that his system of mixing waste is very simple. He has a hopper—a closed bin which is partitioned off about eight inches from one side. He determines the proportion of waste and cotton he is to use, and runs his waste into the smaller division of the hopper and his regular cotton into the larger division.

N. B. Murphy, assistant superintendent, Shawmut Mills, said his system of mixing waste is similar to that of Mr. Mears. "I would like to ask," continued Mr. Murphy, "would we get better results if we included our lap waste and card waste with the scavenger and roll waste? I would like to get some ideas on this. In other words we take all our card and picker waste and mix it in with our roving waste."

Chairman Hames at this juncture described an arrangement which he has devised at his mill for spraying a solution on the roving and scavenger waste before it is returned to the machines in the regular manner. The idea of this proposition is that the cotton in the waste, having already passed thorugh several attenuating processes has had drawn out of it some of its natural tendency to curl and cling together; and it is with the purpose of restoring some of this natural curl that this system was equipped on the waste machine.

The principle of the idea is to have a six or seven inch flannel-covered roller mounted above the delivery apron of the waste machine. This roller revolves slowly in a thin solution of soap and caustic and above the flannel roller is placed a rapidly revolving cylindrical brush. The flannel covered roller carries up from the trough a thin film of the solution and this is sprayed onto the cotton in a fine spray by the brush. These two rollers are operated by connections onto the regular gearings of the machine.

Mr. Hames further stated that after the waste is run over the apron and received this thin spray of caustic solution, it is put in a closed bin where it remains for five days to allow the soap solution to thoroughly blend in the cotton. He has five of these bins and uses them in rotation. He further added that the experiment had shown that some increase in breaking strength had resulted from the application of this solution on the waste.

The next question to be discussed was "Is it advisable to use humidifiers in the opener room?" Opinion on this seemed somewhat varied. Mr. Franklin, of Augusta, said, "I think that humidifiers are of some benefit. One reason, however, why I do not like to talk about it is because I haven't got the data, and I know somebody is going to ask me for it. Cotton comes from the bale with a certain amount of moisture, and the object is to keep that moisture in it and put in more. I think in dry weather the humidifiers do some good in the opening room. I have a couple and use them some days. I am going to experiment further and put them in both the opening room and the lapper room upstairs. We feel that we would get a firmer lap in the lapper room."

Mr. Mears of Monroe said that in his opinion the question of humidity in the opening room was a matter of local conditions that may arise. He brought out that the same principle used by Mr. Hames in spraying the caustic solution on his waste applies here also. "In the absence of having humidifiers," he said, "at one time I remember when we were having considerable trouble with electricity; in making my mix I would put down a layer of cotton and get on there with a sprinkler can and throw it around; then I would put down another layer and let it age and sprinkle it and I found that it was very good. There might be some seasons in the year when you would want humidity and sometimes when you would not want it and I believe if you could have it there to apply when you did need it, it would be a good thing to have, in my judgment."

C. E. Davis, night superintendent, Columbus Manufacturing Co., asked Mr. Franklin if the cotton would clean as well with the humidification as without. Mr. Franklin replied that it would clean just as well in dry weather.

"I made a little experiment in regard to cleaning cotton when it was dry and when it was wet," said Mr. Heymer, "and I am now planning on a system of drying the cotton before cleaning it. It sticks more when it is wet.

"In connection with this, some years ago we experienced a considerable amount of trouble with electricity in our cards. My boss carder came to me and said. 'We've got to do something about it.' I bought two atomizer heads and put them right over my finisher pickers and I was greatly surprised at the wonderful results we obtained. I was then convinced that humidity to a certain extent would do some good in cold, dry weather. Humidity will do good

over the finisher lapper, but I do not believe in humidity over the breakers and intermediates."

"Has anybody kept a record of the numbers?" asked Mr. Murphy. Mr. Mears replied that he had never used humidification to any great extent, but "you will appreciate where you use it that the numbers will be heavy." The gentleman asking the question added that humidity in the picking room might assist in keeping numbers.

Barnard Murphy asked, "Why can't you get the same results by increasing the humidity in the card room and leaving it out of the picker room?" It was suggested that inasmuch as the card room would be discussed later, this question be held over until that time.

Beater speeds and beats per inch was the next question to be considered and Mr. Franklin reiterated the advantage he had derived at this point by the installation of vertical openers. "I changed my beater speeds by putting in the Crighton openers," he said. "We found we could reduce the beater speeds in the picker room and get just as clean work. We have increased the breaking strength six pounds by putting in the Crighton opener, and now beat it 13 beats to the inch, 32 with the Kirschner beater. We formerly beat it 22 beats to the inch using the two-blade beater."

Mr. Wiseman stated his experience was the same as Mr. Franklin's.

"Our experience has been the same as the brother's over there," added Mr. Mears, "We cut out the intermediate pickers and lowered the speed of the finishers and other beaters and the breaking strength of our yarn on the spinning frames went up."

Chairman Hames asked at this point if any one in the room was beating over 40 beats to the inch. Only one man, L. B. Colbert, overseer carding, the Trion Company, indicated that he was. Mr. Colbert has been beating 58 beats to the inch but stated that he expects to run from 40 to 55. He stated that he had to use a larger number of beats to the inch to get clean yarn.

A vote of those present was taken, the chairman announcing that the majority of the men present seemed to be beating 20 beats to the inch and under on the breakers.

"We put in Crighton openers about three months ago," said Mr. Murphy, "and we cut the speed of the beaters on the breakers from about 1,400 r. p. m. to about 1,000 r. p. m., with the Kirschner beater running 1,070 r. p. m., beating 18 beats to the inch on the breaker. We gained from five to ten pounds in breaking strength on 14s yarn."

Mr. Brumby was the next speaker in this connection. "We have had a good deal of experience on this in the last 12 months," he said. "We have been on soft yarn until last year. We make 26s to 36s, and up until the time we began making hard yarns we had never had any trouble with breaking strength. When we started with hard twisted yarn, our breaking strength did not go up. We started different improvements and experiments to try to get it up. We were using 1 to 1 1/16-inch cotton and we tried everything except reducing the beater speed. Then we reduced the beater speed from 1,450 down to 1,000 and we found an average gain of seven pounds in breaking strength on 30s/2. This was using the same cotton as before and the conditions were the same." He replied, in response to a question from the chair, that the increase in the breaking strength named was in the ply yarn, that the increase in the single yarn was about 3½ to 4 pounds. He added that his findings were the results of hundreds of tests.

Ball bearings on picker aprons were next discussed. Mr. Tallent of Macon said that he had tried them on the finisher aprons but could tell very little difference. "I tried it on finishers and intermediates," added N. B. Murphy. "I have H. & B. pickers and did not put ball bearings through to the evener motions. With ball bearings the aprons pull better and their life will be longer. However, I could not tell any difference in the lap, but I have been told if I had equipped the evener motions with ball bearings, there would have been a difference. My tests were made yard for yard."

Mr. Long of Douglasville said he does not have ball bearings on the aprons, but his aprons are independently driven and "they give very satisfactory results. If I had ball bearings on the aprons I would use them."

Mr. Sorrells said he put ball bearings on one finisher apron and it looks to him like the lap is evener. He said he was of the opinion that he got evener work through the card room. "The finisher man occasionally tells me he wishes we would put ball bearings on the other aprons. I asked him why and he said he hardly ever has to move the regulator to even the laps, and saves more laps."

"We have recently installed ball bearings on the evener shaft," said Mr. Long of Douglasville, "and I would like to

have our carder tell you about it."

This gentleman, J. E. Ledbetter, described this as follows: "We put in a sleeve bearing on the quadrant, and also put on an idler cone swing to take care of the belt. I never have to adjust it. We put on a new belt, and it will take up all the slack and keep the same tension on the cones all the time. Where you have a worm drive on the apron and a ball bearing sleeve on the quadrant you will get excellent results."

Reporting on a test he had made, this carder said "I made a test and ran 12 laps on the machine thus equipped and they all weighed exactly the same without my touching the regulator." Mr. Chandler asked him, "What percentage of yard by yard variation did you have?" The gentleman replied that he did not have any variation yard by yard. He continued that on another machine that was not equipped with these devices, he had run 12 laps through and had to move the evener three times to make them come up to standard weight.

Mr. Brook discussed the next question which was, "Are the evener motions on your pickers so adjusted as to compensate with three laps on as with four laps?"

"I was boss carder in a mill on hosiery yarns," said Mr. Brook, "and we had a lot of trouble keeping finisher picker hands. I think I have hired and fired every finisher picker hand in and around Atlanta. Then I set up the evener to where I could make the finished lap weigh the same with three laps at the back and we never had any more trouble keeping picker hands."

"Would you recommmend running that way continuously?" asked the discussion chairman. "No! only for a little while," responded Mr. Brook.

David Clark of Charlotte brought up here another point for discussion: "I would like to call attention to something that came up at the meeting of the carders' division of the Southern Textile Association in Anniston in December," said Mr. Clark. "The question was raised relative to the length of laps. Several men had made tests showing a variation in the length of laps irrespective of weight. Some as much as eight yards. Very few said they could get less than four yards variation."

Since that time some of the North Carolina mills have been making tests along this line, said Mr. Clark, and had found equally astonishing variations. At one mill he said they experimented with the usual practice of setting back laps varying more than a half pound from the weight standard, and then let the laps go on through without checking up on the variation in weight, and they found that they got just as even work after the last drawing process as before. In other words, said Mr. Clark, it seems to indicate that we are placing a great deal of stress unnecessarily on the weight of the lap. He pointed out as one reason for this variation that the logger heads are so constructed that a man does not know what he is really getting.

Mr. Tallent said he had made a test about ten years ago and had found a variation ranging anywhere from 3½ to 8 yards in length with the weight about the same.

W. R. Thomason, superintendent, Palmetto Cotton Mills, Palmetto, Ga., said that after reading a discussion in Cotton about a man having this trouble he started experimenting and found the same condition but that after working on the logger head he had been able to get this variation down to a quarter of a yard. However, he said, as soon as they would wear down the greater variation would return. "You have got to keep the chokes out of the logger heads,'" he concluded.

Chairman Hames said, "I had a man visiting with me the other day who has been in the mill all his life. In going through our picker room this question came up and he told me that he had had considerable trouble with the friction shoe. But he took his leather off and countersunk his lever and inserted cork, and it completely eliminated trouble along this line."

"Should picker machine fans be piped to the dust room separately?" was the next question taken from the questionnaire for discussion. Mr. Massey said he had once taken a job where two machines were piped together, but after changing them to separate pipes he had gotten much better results.

"I had the same experience," added another superintendent.

Mr. Heymer advocated the piping of the intermediates and finishers together with the pipe running along the dust flue to the end of the flue opposite the chimney, the breakers to be piped in separately. The connection, he said, was made in the dust flue. This was in response to a question from the chair.

In discussing the next question—should intermediate laps be weighed and a limit as to variation placed on them the same time as on finisher laps?—Mr. Murphy of La Grange said that he uses only two processes of picking but if he had intermediates he would be inclined to weigh the intermediate laps also.

Frank Heymer seemed to be of the same opinion, as was Mr. Long of Douglasville. Called upon for a statement in this connection, J. W. Knowles, overseer of carding at the Lanett Cotton Mills, responded by asking this pertinent question, "If you have your pickers set to take care of the variation on the finishers, I don't see why it would not take care of the variation on the intermediates." This concluded the morning discussion.

## Luncheon.

Following the morning session the delegates gathered on the steps of the Tech library and "watched the little bird" while a group picture was made. Then they inspected The A. French Textile School, the textile department of the Georgia School of Technology. This tour of inspection was made under the the direction of Professor Clarence B. Seal, the director of the Textile School.

At one o'clock, promptly, the men assembled in the dining room of the school, where a "Dutch" lunch was served, consisting of roast turkey and the necessary frilliations and embellishments that go with it. Members of the Georgia Tech mandolin club under the direction of C. D. Jordan interspersed the meal with delightful musical selections.

George S. Harris, president of the Exposition Cotton Mills, Atlanta, and vice-president of the Cotton Manufacturers' Association of Georgia, welcomed the visiting delegates to the city on behalf of the cotton manufacturing interests of Atlanta, and also brought words of encouragement and a pledge of cooperation from the financial executive body to the operating executives in their plans for the promoting of the discussion meeting idea. He pointed out that his fellow executives felt that while they were endeavoring to forward the industry commercially, that their superintendents and overseers, by such meetings as this, were advancing the industry technically. Mr. Harris suggested that the men in their gatherings promote as far

as possible a feeling that the most good would be derived from their discussions with each other if "Bill" could call "Jim" by his first name and vice versa.

Mr. Harris also emphasized that the consideration of their employees should receive primal attention in the deliberation of the superintendents and overseers; that they should leave no impression to be gained by the operatives that this organization was in any way antagonistic or otherwise opposed to the furtherance of the mill folk.

R. W. Jennings, general chairman of the organization, responded happily to Mr. Harris' welcome remarks. Referring to the suggestion made by Mr. Harris with reference to the operatives, he quoted a portion of the constitution of the organization which lists among its objects "the promotion of such movements as tend to the benefit and advantage of the textile industry and its operatives." Mr. Jennings thanked the men for their interest in attending and participating in the discussion of the morning and expressed the hope that the discussion idea would continue to grow and develop and expand among the Georgia mill men so that greater results might be derived by each one contributing to the furtherance of the work.

Dr. M. L. Brittain, president of the Georgia School of Technology, was the final speaker at the luncheon. He assured the mill men and others present that they would always find a cordial welcome at Tech and offered to the organization the facilities of the school's textile department in any way in which it would be of use to them at any time.

## The Afternoon Session.

was opened immediately after the luncheon. The first matter to be taken up was the apportionment of the terms of the present members of the executive committee. Mr. Philip explained that under the constitution of the organization as adopted by the governing board each member of the executive committee was to serve for a period of two and a half years. This having been adopted after the election of the present members of the committee it was necessary to apportion the terms of these five men so that the term of one member would expire with each semi-annual meeting of the organization. This was arranged because of the fact that at the carders' and spinners' meetings in the spring there would be men present who probably would not attend the fall meetings, and that at the fall meetings men might attend who would not be at the spring meetings and it was desired to give all the members an equal voice in the selection of the personnel of the committee. The five members of the existing executive committee were called forward and drew lots to determine the lengths of their terms of office. Messrs. Grimes and Phillips were absent so substitutes were called to draw for them. As a result of this the term of R. M. Matthews, superintendent, Peerless Cotton Mills, Thomaston, will be two and a half years; that of I. B. Grimes, superintendent, Elm City Cotton Mills, LaGrange, will be two years; that of H. O. Davidson, superintendent, Eagle & Phenix Mills, Columbus, will be one and one half years; that of W. L. Phillips, superintendent, Social Circle (Ga.) Cotton Mills, will be one year; and that of G. A. Franklin, superintendent, Sibley Manufacturing Company, Augusta, will be six months, Mr. Franklin's present term thus expiring with the weavers' and finishers' meeting in the fall.

The practical discussion was resumed at this point under the direction of Mr. Hames. The first question to be discussed was that of the relative merit of heavy lap-long draft and light lap-short draft carding. G. W. Hamilton, vice-president, Crown Cotton Mills, Dalton, was called upon for a statement in this connection.

"We have two mills, one running heavy and one running light laps," responded Mr. Hamilton. "So far as any difference in the product is concerned, I cannot see any, but the theory of the heavy lap, in my opinion, seems to be good. The licker-in will get a chance to comb the fibers better, but I cannot tell any difference in results. In our case we are short of pickers, and the heavy lap of course makes our pickers keep up and helps us in that way."

"I would like to ask what difference it would make if you were going to make a 60-grain sliver out of a 14-ounce lap, and then make it out of a 12-ounce lap," asked Mr. Knowles of Lanett.

"It would make a whole lot of difference," said Mr. Hamilton, "The pickers will produce more on the heavy lap. If you increase the draft you make the machine back of that keep up better."

"But the difference to the work?" asked Mr. Knowles.

"It does the same work," said Mr. Hamilton.

"This is not a question of picking, gentlemen," said Mr. Franklin. "It is a question of whether to do quick light carding or slow heavy carding. The idea is to eliminate the picker room altogether. We want to know whether you prefer working the cotton more or less in the card. My preference would be light lap, carding fast. It goes back to the beating of the cotton in the picker room."

"It doesn't affect the carding at all," continued Mr. Hamilton, "you get the same number of pounds through, the licker-in just hits it more."

W. H. Epps, superintendent, the Jefferson (Ga.) Mills said he runs light and heavy laps. He thinks it is determined by local conditions.

Mr. Epps also asked for the experiences of the men present with the Gordon-Hay attachment for cards. Chairman Hames asked for experiences in this connection and Mr. Heymer commented, "I had them but I threw them all out. This seemed to be the general consensus of opinion.

At this point J. F. Cannon, of the Federal Board of Vocational Education, explained briefly a plan of his organization for the conduct of a summer school for mill school teachers to give these instructors a fuller background of textile knowledge and conditions. A description of these plans will be found on another page of this issue.

The discussion was resumed following Mr. Cannon's remarks, the first subject being that of light and heavy grinding. Mr. Knowles of the Lanett Cotton Mills was asked for an opinion on this, and said that it depends upon the condition of the cards; he prefers medium grinding if the cards are in good condition.

It was pointed out here that the assumption was that the cards were in good condition. Mr. Heymer stated that "if you grind heavy you destroy the point; then it will become necessary to burnish it. If you grind light and often to keep it in good condition, it is better, unless, of course, the card is real dull; that is a different proposition."

Mr. Jones of Augusta said he likes heavy grinding but not too long. He grinds for two or three hours, he said, pointing out that "if you grind too long you ruin the wire. If you grind light you 'dub' your wire off, consequently you won't have a point after a while."

W. C. Hardy of Berryton indicated a preference for heavy grinding, "though not long at a time." He said "I grind my cards so they will strike fire, and I like to see a spark all the way across. I grind six to eight hours, and once every 20 days. I find that I can keep my points on the wire in better shape and get better results by striking fire than by grinding light."

"I would like to ask these heavy grinders why they prefer heavy grinding for a few hours rather than medium grinding for eight or nine hours," said Mr. Brumby. Mr. Jones said he thought the card ought to be stopped when it is sharp. Another gentleman pointed out that by heavy grinding, "you put a burr on the wire that the vacuum stripper won't take off."

W. A. Hunt, overseer carding, Unity Spinning Mills, La Grange, said that running ⅞ to 1⅛-inch cotton, he finds that light grinding on the 1⅛-inch staple is good, otherwise he said the cards will become so dull that the heavy grinding will have to be used anyhow.

Henry Smith said he had been a grinder for a number of years, and had found that the selection of a method of grinding corresponds to the story of the old negro whose employer gave him some "corn licker." "How was that liquor, Sam?" asked the white man. "Jes right, sah; jes right," replied the darkey. "What do you mean, just right," the white man asked. "Well," replied Sam, "if it had been any worse it would have killed me, and if it had been any better you wouldn't have given it to me. It was jes right." Mr. Smith pointed out that if a grinder grinds too light he will touch the toe and if too heavy he will touch the heel and hook the wire.

Mr. Heymer asked what number of emery would be recommended, and the majority seemed to agree on No. 40.

"How many cards do you grind with one emery?" asked C. E. Wisner, superintendent, Scottdale Mills, Scottdale, Ga. Mr. Sorrells said his grinders have two sets of rolls, and cover this set one week and the other set the next week.

"Don't you think it would be better to take the emery off just as soon as it gets slick?" asked Mr. Franklin.

Mr. Wisner said he uses medium grinding just enough to get a light spark, and that he changes emery every four or five cards.

"How often should card flats be ground?" asked Mr. Jones, of Augusta. "I always grind my flats every sixty days," responded Mr. Hardy. "I grind mine every time I grind the cylinder; and grind them medium," said another man.

"I never did think it would be necessary to grind them as long as they ran true," said another. "I grind my flats every time I grind my cylinders, but not as long."

"Do you set the flats every time you grind them?" The answer was, "No, every other time."

Mr. Davidson of Columbus asked at this point if the men were referring to white or colored work, and the majority were running white work. Mr. Jones, carder at Sibley, said he runs some colored work, and asked why it is that his waste from the colored work is about two pounds lighter than from the white work. Mr. Franklin said this might be attributable to the fact that in dyeing the raw stock, some of the short fiber and dirt is washed out. Chairman Hames asked Mr. Jones if there was any difference in the card strips between the white and colored work, and the reply was that the percentage of strips was the same.

Settings next came up for discussion, and Mr. Jones asked if anyone had experimented with card settings for breaking strength. Mr. Brumby responded that he had been setting to a 7 gauge at the feed plate to licker-in, and "last year when we tested we changed our settings and took various settings. About two months ago, however, we went back to the 7 gauge. This is on a 13-ounce lap from 1⅛ good middling cotton." Mr. Brumby said they got a better breaking strength with a 7 setting at this point.

Mr. Hunt of La Grange said that for a 13-ounce lap he uses a 17 at the feed plate and a 10 for the licker-in to cylinder.

"I have experimented for the last 20 years," added Mr. Jones, "We run about a 14-ounce lap making a 65-grain card sliver, and I find I get good results with a smooth 10 at the licker-in to cylinder and a smooth 12 feed plate to licker-in. I used to run some 1¼-inch staple and we set to a 22 at the feed plate. On my ⅞-inch stock now, however, we get better results with a 12."

Mr. Hunt asked what was meant by a "smooth 10" and " a smooth 12." It was explained that this setting was one "loose in the low places and tight at the high points."

When discussing the next question—what card draft do you find best?—Mr. Brook of Greensboro said he uses an 89 draft, but when it was necessary, has gone up to 110, 120, and even up to 125 with no injurious results. Mr. Jones said he had once used a card draft of 150 with satisfactory results. The carder from the Crown Cotton Mills at Dalton said he has two drafts—120 and 100—and "I cannot see any difference; the breaking strength is the same."

It became necessary at this point to bring the discussion on carding to a close, and inasmuch as a number of spinners were present, the subject was changed to spinning. This was made necessary because the time for the session was getting short and it was desired to take up spinning questions before the men would have to leave to get afternoon trains home.

The first question under spinning was that of drafts. One man responded to a question from the chair that he is using a draft of 6½ on single roving. Mr. Strange, overseer of spinning at the Berryton Mills, Berryton, Ga., said he makes hosiery yarns, and it is very seldom that a breaking test is called for on yarns of this type. After attending the Anniston meeting of the Carders' Division of the Southern Textile Association, however, and hearing the discussion there on breaking strength, Mr. Strange said he had returned home and purchased a testing machine and had made some tests on his breaking strength for two weeks prior to the Atlanta meeting. His tests had shown, he said, that "with a shorter draft we get about seven or eight pounds more breaking strength on double roving. On 2.30 hank roving we had 13s running and also some 13s on 3 hank roving, and the breaking strength was more on the 2.30 hank roving. My tests showed my best draft was about 8."

H. E. Runge, assistant superintendent, The Trion Company, requested discussion on the question of filling wind for warp yarn. Mr. Franklin replied that he has equipped his mill with filling wind. "We run a variety of numbers, with an average of about 14s," he said, 'with a two inch ring, 3¾-inch gauge. When the engineers put in these frames, they figured them for catalog speed with warp twist. After the frames were running on filling wind we found that we could take out three teeth of twist which

threw our speeds up considerably above catalog speed and we are running over catalog speed on our frames, our breaking strength increased five or six pounds. Our spinners are running just as many sides and we get a better, smoother yarn." Mr. Franklin runs a front roll speed of 145 r. p. m., he said, making 20s out of 2 hank roving.

Mr. Tallent said he made a test that showed about five per cent increase in production with filling wind, and an increase in breaking strength. The production increase, he said, was due to taking out twist.

O. W. Smith, overseer spinning, The Trion Company, Trion, Ga., said they had tried the 1¾-inch and the 1⅞-inch ring, with a 3¾-inch gauge and a seven-inch bobbin, but that with the filling wind they could not get enough yarn on the bobbin. He wanted to know how to accomplish this, pointing out that when the frames are stopped for doffing production is lost.

"We get two pounds more to the frame," said Mr. Franklin, "using the same size ring."

"I speeded my front roll up considerably and got 125 yards more on the bobbin with filling wind," said Mr. Anderson of Lanett, "my work runs better and the breaking strength is up five or six pounds." Mr. Anderson speeded his front roll up from 142 to 172 r. p. m.

Charlie Sweet said "Our tests have demonstrated that we could get the increased front roll speed, that our breaking strength on the bobbins was just as good, but on the spools it was not as good as on the warp." Mr. Brown of Atco said he had found the yarn to be five per cent stronger on the spool than on the bobbin.

"How come?"

"Don't know how to explain it," answered Mr. Brown, "but if you'll come up to Atco, I can show you." Possibly this was to be attributed to the taking out of twist, one man explained.

"I'm a 'babe in the woods' on this taking out twist business," admitted Mr. Franklin, "and I'll be damned if I can see how a man can hold both ends of a string and take out the twist by twisting it. I can see how you could dislocate the twist, but that's all."

Mr. Brook stated he had made several tests recently with regard to filling wind on warp, and had been able to take out three teeth of twist on 23s, and gained about five pounds in breaking strength. He said they speeded the front roller up from 126 to about 136 turns on the filling wind.

R. L. Duke, overseer carding, Eagle & Phenix Mills, said he was able to get about five per cent more yarn on the bobbin by the use of a smaller bobbin without the taper, and was running the front roll at least ten more turns per minute.

Referring to his previous statement in this connection, Mr. Anderson said he at first got about 200 yards less yarn on the bobbins, but that after slowing down the traverse and winding the yarn close together, he was able to get the 125 additional yards mentioned.

Replying to a question, he said he didn't have a bunch on the filling wind, and when Mr. Franklin asked what the object of the bunch was, the chairman replied, "It will fill it out more."

As the time continued to grow short, it again became necessary to discontinue the discussion of the questions in the questionnaire seriatim, and the chairman called for any special questions to be discussed. Mr. Matthews of Thomaston requested discussion on Question 7 in the questionnaire, which was "Have you tried using wax or other dressing on the spinning bands or tapes?"

Mr. Wiseman replied to this question by saying he is using wax with very good results. He applies it to a certain number of bands a day, he said, getting around to every band about once a week. Barnard Murphy asked if the waxing of the bands had any effect on the quality of the yarn. Mr. Wiseman replied that he had noticed no improvement in this respect, but the advantage came in better satisfied spinners and the ability to run more sides. He said his spinners are running from eight to ten sides and some of them want twelve.

Explaining his question, Mr. Murphy said he had been told that waxed bands or tapes would affect the quality of the yarn; less variation in the running of the spindle, he explained, will make a smoother yarn, and a smoother twist will make a better yarn. "I am going to try it," he said. Mr. Sorrells said his frames are individually driven, and increase of about ten per cent in strength. He pointed out as the chief advantage that it will reduce the number of bands down considerably. He gets around to every band about every two weeks. He said that now on a Monday morning he can only see about two ends down on a 112-spindle side after being stopped over the week-end.

Mr. Matthews asked if there was any soft spots in the yarn produced by the bands slipping upon starting up. Mr. Sorrels said his frames are individually driven, and that as they go at about 10,000 r. p. m., he had never been able to notice any effect on this score. "Can't sight 'em down that fine." However, he said no noticeable soft spots had appeared in the yarn.

The relative merits of tape and band drive on spinning were next taken up. Mr. Heymer said he considers the tape drive much more satisfactory.

"I have never had the tape drive," said Mr. Murphy of La Grange, "but I once had a man ask me if there is any limit to the fineness in numbers on which tape drive can be used." Mr. Murphy explained this by saying that when the tape drive first came out it was recommended for twisters only, then for coarse yarn and now they are going on up on the numbers, and he wanted to know if there was a point of differentiation in numbers that could be spun with the tape drive.

Mr. Franklin said he had never spun the finer numbers, but didn't see why the tape drive could not be used on them.

Chailman Hames said that the point might be raised because of the smaller spindle used on finer yarns.

"I know a mill equipped with tape drive on the twisters," said Mr. Franklin, "and they also have a mill with band-driven twisters, and there was so much difference in the uniformity of the yarn that a critical buyer wouldn't have the yarn twisted with the band-driven twister spindles. He said he didn't know why, but the yarn from the tape-driven twisters was more uniform."

The chairman then brought up Question 3 in the questionnaire—which is best from the weaving standpoint and from the spinning standpoint—running the traverse on filling up slow or down slow? Mr. Franklin said he didn't believe the weaver would let the spinner run it down slow. On a call from the chair for a show of hands, four men indicated they were running the traverse down slow. "Weaver's not the boss there," was the comment on this.

B. L. McDonald, overseer spinning, Mary-Leila Cotton Mills, Greensboro, Ga., said he runs it down slow be-

cause "when the traverse is going down there is a greater strain on the yarn than when it is going up." He said that while in some cases there might be difficulty with the filling sloughing off, he had never experienced this trouble.

"Those are my sentiments," said C. F. Springer, overseer of spinning, Crown Cotton Mills, Dalton, Ga. Mr. Davidson of Columbus brought it out as his opinion that "probably running the traverse down fast would be of more value on coarse numbers than on fine numbers."

R. M. Matthews next asked this question, "How many in the house are going to the trouble of drawing the oil out of the spindle bases and replacing it with new oil, when putting in new spindles, or with the old? I have been doing this and I am just wondering if I am doing myself any good. I figured that you have from ⅛ to ½ an inch of space down there below the bottom of the spindle that will take care of the residue, but I should like to have some of you discuss it."

Epps advised Matthews to quit it. "How often do you oil the spindles?" Mr. Crowder asked him. "Twice a week," he said, "running day and night."

"Our spindles get dry at the top," said Mr. Matthews. "Do your spinners raise the spindles and flush the oil out?"

"Every time they oil them," said Mr. Anderson.

"Which is the better way to run warper drums, backwards or forwards?" was the next question. Mr. Powell of Atco prefers running them backwards, among his reasons being that it gives the girls a better chance to tie the ends. The gentleman from the Crown Cotton Mills said his help had rather run them forward. Mr. McDonald of Greensboro said he runs his forward. "Less tension running them forward," said Mr. Anderson.

Relative to tension, Mr. Matthews brought up the question of uneven yardage on warper beams, asking "Can anybody run two beams on the same warper and get the same yardage?" Mr. Franklin said he had had the same experience as Mr. Matthews. No one answered Mr. Matthews' question in the affirmative, and it is thus a matter for further discussion.

It was necessary to bring the discussion to a close at this point, and Charles A. Sweet, chairman of the resolutions committee appointed by the general chairman, read resolutions that the discussion method of holding meetings be continued, and that the organization express its thanks to the Georgia School of Technology and the mills of Atlanta for the many courtesies and privileges granted, making this first meeting a success. These resolutions were adopted by unanimous vote.

And so the meeting was brought to a close.

Announcement was made that notification of the date of the next meeting would be sent out as soon as it is definitely settled.

# Storage Engineering

BY R. A. SONIAMAN.

PART TWO.

## Special Phases.

Some one coined the saying "a place for everything and everything in its place." When, however, one investigates the storage system around the average mill, it is remarkable how every nook and cranny is sometimes crammed full of stuff that belongs anywhere else but just where it has been deposited.

Entries in mills that have the elevator in the towers are usually reception halls for everything that moves in and out of the mill and often of material that seems determined to make an entry its last resting place.

To litter up an entry that is used as a passageway by the workers to and from the different floors is bad practice. Suppose a fire were to break out suddenly. What a chance for a mix up, if nothing worse, when the workers from an upper floor run into an entry so packed with trucks, boxes, boards. and so on, that it is a regular maze, filled with blind passages!

It must be obviously patent, then, that entries should be used as storage plants only when the stress for room is great; moreover, exceeding care must be taken that ample room is left for the passage of workers.

## Trucks.

Trucks of divers designs are used for temporary storage, and it is a good engineering feat to make a wide utilization of this idea. On account of their mobility, trucks reduce the extra handling that is bound to ensue when material packed in stationary racks is to be moved to another process or department. With trucks, it is simply a case of pushing them where they are required, or on to an elevator, and then up or down. Or right onto a conveyance for transfer to another mill.

Storage of material that is to have its final disposition in the same room can also be arranged on small platforms under which a special truck is pushed that by means of a raising and lowering device makes it possible to pick up or deposit a load wherever desired.

Infinite, one might say, are the styles and uses of trucks. For laps from pickers to cards there is the narrow truck that will accommodate 4 or 5 laps at once, each lap being so disposed therein that it can be removed without disturbing its neighbors.

Roving trucks for handling the roving from slubbers and intermediates can be arranged in a suitable size to take care of the product of one or more doffs. When pinboards, of either wood, or metal are used—no matter what department—the trucks must be equipped with slides so that the boards can be pushed into the trucks and removed one by one without the slightest interference from neighboring boards. Trucks of this type are particularly good as storage agents since any special board can be removed at will.

Other trucks for use in packing up different classes of material for use about the mill can be devised for any particular purpose. As to the number of trucks to have about, why that is a matter for each individual mill to take up.

Yarn in its various stages of manufacture makes up the biggest item of stored material that requires a definite amount of space; for no matter how rapidly the movement of the material to and from this space, the amount of room required must always be maintained.

For the removal of this material to different temporary centers on the several floors of a mill, elevators, conveyors, chutes, and exhaustors, are the usual means of transportation, outside of the ubiquitous truck system.

Conveyors or chutes should be located to reduce to a

minimum the movement of material to and from them. Exhaustors, of course, can be so arranged to drop the material at any point desired. In the picker house a lattice system in conjunction with the exhaustor makes it possible to drop cotton in any required bin.

## Racks.

Racks and bins for stationary storage can be made to suit any material or style of package. Just a little study and ingenuity will usually suffice. For supplies, repair, and renewal parts, it is advisable to have the storage in small units so that each class of materials or supplies will be by themselves and all easily accessible. In this respect, racks similar to those in the layout, Fig. 1 harmonize well with efficiency ideas.

Fig. 1, A, shows the ends of the racks which may be of any height desirable—up to the ceiling, if necessary. The width also can be laid out for the particular types of goods

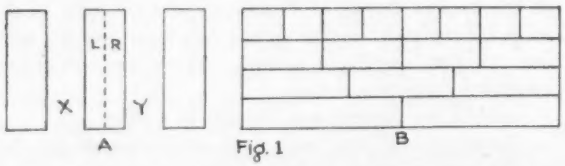


Fig. 1

to be stored. Assuming that there are three rows of racks, all three may have a passage of sufficient width between and around them to permit the entrance of any trucks used for conveying the goods. As indicated in the middle sketch, the racks have a partition running the full length along the center and parallel to the racks, leaving one-half the racks, L and R, to be reached from the alleys X and Y, respectively. The partition, it may be said, is optional also, but it is advisable when small quantities of small stuff are packed away. It facilitates finding the material and limits the room to just sufficient for the accommodation of the amount considered as a normal quantity to carry in stock.

B, Fig. 1, represents a sideview of one of the racks and shows how variable the shelves can be made to suit practically every conceivable requirement.

Racks of wood are easily built and can be designed for the particular needs of any plant. Storage facilities of this type are receiving the attention of makers of steel goods, and there are several firms advertising just such equipment in steel, which has numerous advantages.

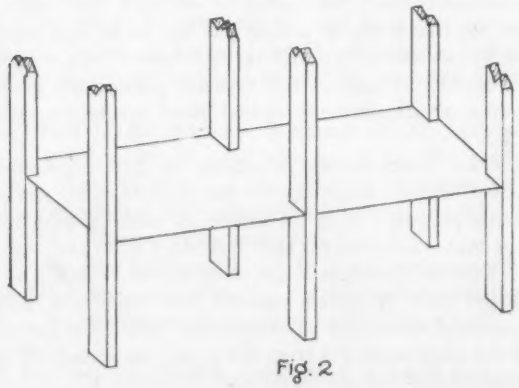


Fig. 2

Oftentimes it will be found advantageous to build some temporary wooden shelves, of simple design that will keep the material in good order and in proper segregation. Fig. 2 gives an idea of such a rack. With this system of storage shelving may be combined the practice of using wire netting for partitions. The wire may be of whatever design or thickness required—from ordinary chicken wire to the heavier, fencing wire. Wire is particularly good for partition work because it does not obstruct the light, but it does allow the spread of fire, which is obviated in an all metal equipment.

In all of this shelving, it must be borne in mind, that to keep up to the best efficiency standards the shelves must be designed with the view of permitting easy access to and from them.

To protect material in these racks from fly waste and other dirt, a simple curtain like that illustrated in Fig. 3

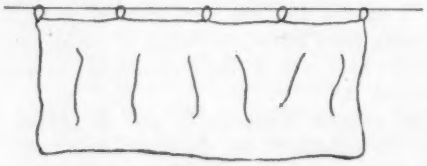


Fig. 3

can be used. As seen from the sketch, a wire or band is stretched from one end of the rack to another, or from one section to another. Metal rings are fastened at regular intervals to the curtain and are run on to the wire or band.

## Emergency Storage.

In emergency storage one of the chief faults that come to the attention of an observer is that of packing material so that there is no way of getting to any part of the pile excepting the front or side. Fig. 4 exemplifies the point alluded to; for here it is assumed that cases of material have been stacked into a corner. A glance shows that if

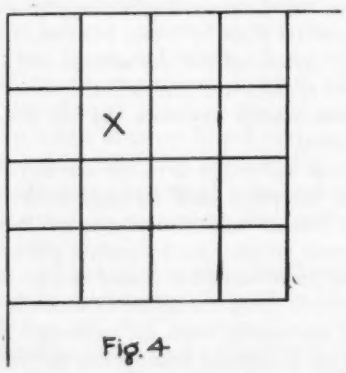


Fig. 4

it is desired to get a certain case, say the one indicated by X, it would be necessary to move a goodly number of other cases.

A better disposition, especially if there are several classes of material to be stored, would be that portrayed in Fig. 5. Here, it will be seen, there is ready access to every class. The material may stay here a week, a month, or a longer period, yet, the moment that any one kind is required, it can be immediately removed without the vexatious delay occasioned by having to remove cases of other material.

It may be objected that the disposition illustrated in Fig. 4 is an extreme instance, one that a man sufficiently alert to his duties would naturally avoid. But is it? Let the reader look about his mill and see if he cannot find material stored somewhere in this very identical manner.

Furthermore, most mill men, general overseers and sup-

erintendents for example, men who have charge of several rooms, can readily recall how some certain material long since thought to have been run up has been dug out of the center or back of just such piles. And how annoying, to put it mildly, when it was found to be of an entirely different grade or quality from that being run at the time of its unearthing. Or, the time when it was known that several lots of the same material were somewhere—but where? Oh, yes, a live wire executive ought to see that the method in Fig. 4 is faulty, but—

When heat is injurious in any way to the stored material, it is well to keep the goods away from steam, or heating pipes, when the latter are near the floor along the walls of a building. In the case of the illustration, Fig. 4, the material should be so disposed of that there will be a space between the material and the wall, see Fig. 5. It is well,

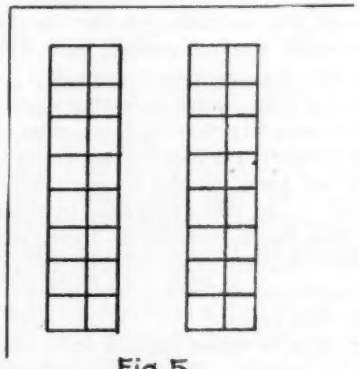


Fig. 5

in all cases, to have enough room here to give access to the windows, if there are any. It should be borne in mind that excessive heat is apt to soften the shellac, and so on, on the bobbins and spools used around the mill. When this happens, the first layer of roving or yarn will become attached to the barrel of the bobbin or spool.

## Blocking Passages.

Another important point to look out for in storage is that of blocking the passage to the fire-fighting apparatus—pails, chemical containers, or hose. The first two can, it is true, be transferred to other places, if the room in their immediate vicinity is desired for storing; but in the case of a hose attached to a standpipe, a passage to this, above all things, must be provided for.

Another case of faulty storing is that of packing things near a much used doorway in such a manner that for short periods of time there will be an absolute blocking up of the opening. Besides the fire risk, such a mode of storing is disadvantageous from two standpoints:

(a). It interferes with the work of those employees whose duties take them through the doorway, and

(b). The men doing the storing are hampered by workers going in and out of the opening on legitimate business.

Coming to another phase of storing, there is no doubt that at some time or other, every one has watched the building of a pile of goods, only to see on completion of the stack, or a day or two later, the whole fabric coming tumbling down. Bags and boxes are among the packages which are peculiarly susceptible to this aggravating performance.

One often finds that the full storage room that could otherwise be utilized by going several tiers higher is lost through the fear of the goods falling over. A good remedy for toppling is to use 2 x 4 timbers, running them from the floor to the ceiling. Racks, of course, can be used; but the timbers will be found a cheap, efficient method in many cases. Something on the style of Fig. 2.

The danger of mixing the contents of boxes that topple over is sufficient reason for looking into this matter. Filling boxes of yarn, stored in cellars and subjected to faulty piling will often tell a tale when brought to the light of day. The same is true of different types and sizes of bobbins and spools, and so on, which may become a conglomeration that will take quite some time to straighten out.

## Identification Marks.

It may appear almost laughable to give the caution that everything stored away should have an identification mark of some sort on it, whether the storage is to be of short or long duration. But let anybody whose risibilities have been aroused take a walk around his mill, say, on a Saturday afternoon, when everything is quiet. Perhaps he will get quite a shock.

For, here will be a batch of spun yarn with no mark of any sort to indicate its counts, over there a lot of spooled yarn in similar straits; while in another room will be a last doff rushed from the speeders with crayon marks missing. And so on, ad infinitum.

Tickets, tags, and labels, as well as crayons of different shades are to the identification of stored material what a hammer is to a carpenter.

Another very universal fault in storing is that of placing material, skeins, tubes, spools, and bobbins of yarn directly on the floor. Here it is exposed to the assaults of the sweeper boy, the scrubber man, the wheels of every Tom, Dick and Harry's truck, and lastly, but far from least, the danger of a soaking by water, whether the latter comes from an inadvertently overturned scrubber's pail or from a more or less distantly bursting sprinkler head.

A better way is to place timbers on the floor, if the storing is only temporary; or to build a low platform to meet the requirements implied in the previous paragraph, if the storage is to be permanent.

The omnipresent hanger is a never failing pest in the scheme of storage. Every overhead hanger must be regarded by the storage engineer as a potential enemy. It may be that a hanger will be real friendly for a long time, and then, suddenly, will vent its spite on whatever happens to be below it.

Oil stains, especially of mineral oil, and their obstinate reluctance to leave any cotton goods to which capillary attraction has given them a foothold, are so well known that it would appear that no one would ever attempt, or permit, stacking anything under a hanger. But in mill work one must always reckon on the fallible human equation—to work an old gag to death. Therefore, it is in just such a situation that an observing operating executive will take steps to forestall the inevitable disaster that will befall material so stored.

And these steps are to have a specially designed drip pan placed under the hanger to catch all the little wayward drops, and also the stream that ensues when a careless oiler turns his cup upside down over the hanger. Scrapers can also be placed at the ends of the bearings to prevent the oil from running along the shaft and then yielding to centrifugal force, or to the slower but never-failing lure of gravity.

## Fly Waste.

Card rooms, as well as spinning and spooling departments, are notorious for the quantities of fly waste that floats through the air, eventually gravitating toward whatever object may be situated below. Being of a clinging disposition, fly becomes incorporated into the body of a yarn, and obviously, results in a deteriorating of the latter's quality.

Whenever storage in these departments is of a permanent nature, racks that will enclose the material should be provided. If the material has to be temporarily stored in divers other places in these rooms, it is advisable to use covers of some kind to obviate the ravages of the fly-waste.

Those mills that make a ply yarn usually do this work on what are known as twisters—usually wet twisters. This type of machine requires lubrication on its rings to facilitate the progress of the ring-traveler. Grease is generally used. During the period of applying the grease to the rings, the machine is stopped. Now, when the frame is started, the rapid movement of the revolving traveler assisted by centrifugal force throws a large part of the grease away from the frame in the form of a fine spray.

Any object within its radius will be showered with this spray of grease. It would seem to anyone who has ever observed this peculiarity of the twisters that only a "dumbbell" would leave anything, say yarn, near the machines. Nevertheless, a walk around the twisters will often convince an investigator that a manufacturer of the above-mentioned gymnasium apparatus would find plenty of material in the twisting department. A board partition, or a rack with wooden back will solve this peculiar storage problem very nicely.

What has already been said about the playful antics of an overhead bearing can be applied with equal force to overhead belts. Belts in motion gather up a large amount of very dirty fly waste and other dust. If the brushing of the belts is neglected even for a short length of time, the belt becomes overloaded and pieces of the undesirable matter become loosened and start for a new resting place. Naturally, if there is any material stored directly under such a belt or within reach of the matter it throws off, such material will get the benefit of the dirt.

## The Cellar.

No discussion on storage would be complete without bringing the cellar out of the gloom and into the limelight. Always has the cellar been a stronghold for the storing of all kinds of stuff, and for that matter regardless of whether the material was worthwhile keeping for future use, or whether it was in the last stages of desuetude.

The trouble with cellar storage is that so much useless material gets piled away that in a short while the cellar is full, and then when a certain thing is needed, no one is able to locate it among the trash. For this reason it is well to have everything in the way of supplies, and repair parts, spools, bobbins, and so on, looked over by some responsible person before admitting it to the cellar.

One visit to a cellar where no special pains are taken to keep the place straightened out, will convince the reader that to store anything in such a place is on a par with the story of the steward who asked his captain if anything could be lost if one knew where it was.

"Certainly not," the captain replied.

"Well, then," the steward continued, "the silver percolator isn't lost because I know it's at the bottom of the sea."

The material put haphazardly into a cellar by everybody in the mill is not lost—certainly not—because it is known to be there; but if a part should be needed quickly in a breakdown—why it might just as well be lost.

Some mills seem to take a sort of special pride in keeping their cellars in a state of Stygian darkness. There may be room enough to store four times the amount of goods that are in it, but because of the lack of windows and the poor lighting installation, the full use of the storage facilities is impossible.

Such cellars should have windows broken through, even if the latter are only small ones, and the lighting system should be overhauled.

A further suggestion is: that if possible to arrange it, one man should be delegated to look after the cellar. A good cellar man will easily earn his wages by keeping idlers and rubbish out of the cellar, and through a systematical disposition of the materials, whether supplies, yarn in process, or repair or extra machine parts will enable the mill to get what it wants when it wants it.

If a plant is large enough to warrant such a procedure, it is good economy to utilize the entire cellar of one building for the storage of not only the supplies of the firm, and the usual repair parts, but also the many pulleys, hangers, shafting, and so on, that are always gathered up in the course of time, due to changes in drives, re-disposals of machines and the like. Every piece of such material should be tagged and recorded so that it may be immediately available when required.

Storing yarns in cellars requires strict oversight—particularly in the storage of yarns for conditioning where the yarns are expected to remain in the cellar for a specific length of time. It is, therefore, very important that the oldest packed yarn be the first to be drawn on.

But it is a matter of fact that even such yarns are packed away so that certain lots are actually lost at times. A few years ago, a certain mill that prided itself on being up to the minute on efficiency systems, was shocked to find that the storage of yarn in its cellars had been so laxly looked after that several boxes of yarn, buried amid a pile of other yarn, were so badly mildewed that they exuded a very strong odor. In fact, it was the stench that eventually brought the deplorable condition to light.

Mice and rats are foes of storage in cellars. Material of all kinds suffer from the depredations of these rodents. It is not unusual to find the yarn on ring bobbins pretty well chewed up and the identification tickets and tags are often so badly mutilated as to be absolutely useless. Here is another phase of the storing that the cellar man would benefit by the judicious use of traps and poisons.

Cellars, again, are very susceptible as a rule to floods from heavy rainstorms, especially when the surrounding territory is not properly drained. When such an emergency may be expected at any heavy rain, it is well to be foresighted enough to have the material packed on low platforms out of reach of the water. A stitch in time saves nine.

## Small Stuff Storage.

The use of drawer and cupboards for the storing of small stuff supplies and machine parts directly in the mill rooms could be gone into with great detail. No attempt, however, will be made here to go deeply into this branch of storage; but for the benefit of those who are disgusted with the sight of drawers that are crammed full of miscel-

lany which almost precludes finding any particular nut, bolt, or wrench, it should be said that if the drawers are subdivided into chambers as shown in the sketches, the different materials can be put into their respective compartments and will always be easily accessible.

Sketch 6 shows a drawer that accommodates wrenches, hammers, files, and other long implements; whereas sketch 7 gives an arrangement suitable for small stuff such as nuts and bolts, washers, screws, guide-eyes, ad infinitum. A

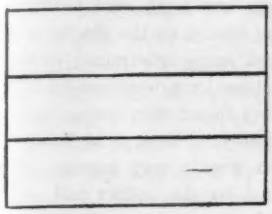


Fig. 6

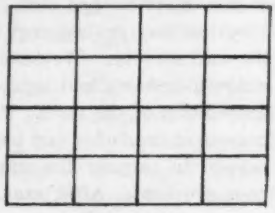


Fig. 7

good type of a small compartment-storage rack is that in Fig. 8. Doors can be fitted to this cupboard to preclude loss through theft, and so on.

Sometimes it is good practice to reserve a storage space for supplies and machine parts within each room of the mill, and to fence in this enclosure with spaced boarding, or wire screening so that the material will be safely stored and yet not occlude too much light.

Rooms that have high ceilings can often take advantage of this fact and build a storage platform just under the ceiling at some end of the building. Access to the platform can be had by ladders, stairway or other form of ascension.

Change gears—such as draft and twist—are perhaps the most numerous of the gears kept in stock in a mill. Some mills adopt the cupboard system of storing such gears, a

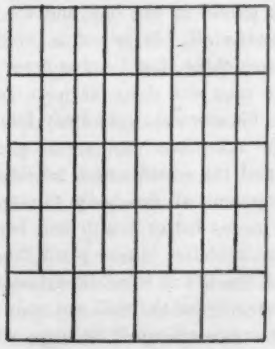


Fig. 8

small compartment being allocated for each size gear. It is nothing unusual, however, to find that in the course of time that a cubby hole devoted to, say gears of 30 teeth will contain 29's and 31's, and very likely, others too. This is generally the case when several persons handle the gears and no one person is assigned to keep the gears in their proper places. Changing of machines is often delayed because the proper gears cannot be found, when as a matter of fact, several of the gears sought after may be loafing in neighboring compartments.

Probably one of the best preventives of mixing the gears is to attach a pipe rack to the wall at some convenient place, having each rod take care of a certain size gear, Fig. 9. Any deviation from this rule can be instantly detected; because a larger gear extends beyond its neighbors, while a smaller one will be buried among its neighbors. (An excellent system of gear storage and record was described on page 163 of the January, 1921, number of Cotton.—Ed.)

## A Stores Keeper.

No matter what the style of storage any mill desires to keep in force, it is essential that some responsible person be given the task of looking after the supplies and machine parts in a room. "Too many cooks spoil the broth," is true also where every Tom, Dick, and Harry stores and draws on stores for his requirements.

Usually the room without a storekeeper will run out of something just when it most needs it, and on the other hand it will sometimes gather an accumulation of a certain material that it cannot possibly use in years to come. Much of this can be avoided by making it some one person's business to look after the stores.

It should be evident to every reader who has reached this point that a discussion of storage could go on almost indefinitely, because there is so much to it after one scratch-

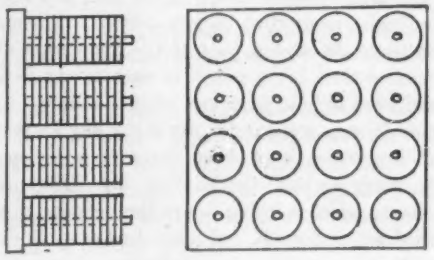


Fig. 9

es underneath the surface. Some plants may find the storage problem a comparatively simple affair on account of their layout having been conceived with the idea of taking care of it; other places are in a daily quandary as to where to stack their material.

In the former case, however, careless storing can eventually choke even the most capacious allotment of space; while in the second case, the very lack of room, precluding too great a stock of material may be the means of forcing a plant to put its storage on a scientific basis, thereby actually resulting in a saving to the company.

Not everything that goes within the purview of the storage of a going concern has been touched upon here; and although some of the phases mentioned have been gone into rather exhaustively, others have merely been—so to say—drawn to the reader's attention.

(This is the final article of a series of two articles on Storage Engineering.—The Editor.)

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Members of the American Cotton Manufacturers' Association, will meet in Richmond, Va., on May 16 and 17, for the regular annual meeting. The Jefferson Hotel will be convention headquarters, and Secretary Winston D. Adams has reserved rooms at this and other hotels in the city for the use of the delegates. C. E. Hutchison, president of the Association, will preside at the sessions, in which speakers of note will take part. Those who have attended previous meetings of the Association in Richmond know the charming hospitality of the people there, and are anticipating the occasion with pleasure.

## What Can We Do To Promote Good Will Among Our Operatives.?*

BY A. STANLEY LLEWELLYN.†

We hear a lot these days, and have in the past, about labor and capital. I dislike those words very much because they suggest strife and lack of confidence in each other, and distrust. Let us forget these terms and liken industry unto a three-legged table. The three legs which hold up the table of industry we will consider as Investors, Managers and Operatives. These are the three fundamental factors which enter into our industrial life today and unless these three legs are strong, sturdy and of the same proportions, the table is of no use.

Now to take up these three essentials of industry one at a time and see what each one contributes to the whole table of industry. The investors are those who furnish the capital and therefore they become a very essential part of the whole scheme. Because of environment, sometimes a lack of technical knowledge, or talents along other lines, they do not do the actual work in the mill. Yet their anxieties, their brain work, and their sympathies are in the mill, and the success of the mill is in proportion to their interest. The managers, who constitute the second part of the foundation are those who organize their brain power in such a way as to know when and what to buy, when and what to sell, and to keep a budget aside as a surplus for the rainy day so that in the time of depression, even when the mill is losing money, they can carry on until the brighter day. They also must follow the trend of working hours throughout the country, the market price of goods, and a hundred other things which go to make up a successful organization.

And now comes the third leg of the table, or the operative. When I worked at the bench learning my trade as an apprentice, I little realized that there were other factors in industry besides the man who actually worked at the bench, but through study and experience, I have learned that there are two others just as important to the whole as the working man.

The main goal for all three is the same, in order that all shall benefit, and that goal is production. Production depends upon the efficiency of the individual, and a person's efficiency depends upon his ability to work and his willingness to work. His ability to work depends upon his mental fitness and his physical fitness.

Our slogan is "Health and Happiness, More Earning Power and Hence, More Production," and we realize when we arrive at a maximum production that we have reached our goal.

A person's mental fitness can be strengthened and built up through education. That applies to each and every one of the factors in industry. In the mill, however, Americanization classes, textile classes, training schools within the plant, dramatic clubs, glee clubs, civic groups, plant papers and other proper literature, all tend to make a man a better man for himself and help him to do his duty in the world.

Under physical fitness, I have been told that 90 per cent of the time lost on account of sickness is directly or indirectly due to poor eye-sight, decayed teeth or diseased tonsils or adenoids. These figures are astounding and it means money out of the individual's pay envelope and it means that the world is losing a vast amount of production. Hence, the only logical way to get at the root of this whole matter is by ascertaining through a physical examination, the cause of the lost time. This examination is voluntary—yet 90 per cent of the people have accepted it. It must be understood that the examination is not for the purpose of finding out whether a man is fit to work or not, and if found with defective eye-sight, teeth, etc., then discharge him. This is absolutely not our purpose. After the physical examination, if we find that the eyes and teeth need further attention they are referred to the oculist or the dentist as the case may be. We have found many interesting cases where indigestion and hence lost time have been caused by a condition of the teeth. We have found men losing time because of headaches and have discovered them to be handicapped in earning the maximum weekly pay because of poor eye-sight. After examination by the oculist and after proper glasses have been obtained, we have noticed that the lost time has decreased and their earning power has increased and therefore they are happier and healthier. We find that at the Dispensary many wounds are dressed, advice is given and preventive methods practiced, all of which save a person from losing time and paying for visits to the doctor.

This all means that we are doing our part toward reaching the goal which is essential to us all. Alternation of position at work, such as sitting or standing where that is possible, and rest periods, are doing much to guard the physical condition of the workers. I have not time to go into that in detail.

I remember when I learned my trade and carried my lunch. It was composed of a couple of sandwiches and a piece of pie in an old folding tin lunch box, and a pint of tea in my back pocket. I heated the tea by placing same in the double boiler of my glue pot. Eating this lunch on a bench was not a very attractive proposition, especially when a banana was placed in the box and all the food had absorbed the banana oil. It is not a thing I have read in books, but is something that I know from actual experience—that when a man sits down at noon time to a real hot dinner, warms his stomach, gets away from his work, when he returns the afternoon run seems shorter. His work seems better and the world seems brighter.

The development of the body through recreation and athletics also means better health and hence more production. However, athletics in any plant should not be put on a professional basis, but inter-department teams and representative teams from the mill not only help the players physicaly, but create an esprit de corps which reflects itself during the working hours in the plant. The fans who follow the teams get together in the field and cheer and root for one common cause—their mill team, thereby getting their lungs full of good pure air, giving vent to the spirit of youth and forgetting their work. And they are better able to fill their places in the industrial world on the following day.

Sanitary conditions, proper ventilation and light all tend toward this end of physical fitness.

Let us now sum up thus far, the scheme:

Production depends largely upon the efficiency of the individual. Efficiency depends upon his ability to work and he is made able to work through mental and physical fitness,

(*Continued on page* 493.)

*An address before the textile operating executives of Fall River.
†Service Manager, Lancaster Mills, Clinton, Mass.

# What the Southern Mills are Doing

Encouragement of thrift among its employees has solved for the Pacolet Manufacturing Company, Pacolet, S. C., a problem that for many years has caused textile manufacturers concern—the tendency of the average textile worker to become a transient. Through the establishment of an employees' savings bank the company has accomplished more to overcome the migratory tendency of mill workers during the last five years than was accomplished during the thirty years preceding.

Victor M. Montgomery, president of the Pacolet Manufacturing Company, conducted an investigation five years ago that resulted in the discovery that only one employee in every ten employed by his company had saved money. Many of these employees were past fifty years of age and had been employed in various cotton mills before securing employment at Pacolet. Mr. Montgomery's inquiry disclosed that only $27,225.22 was on deposit in the offices of the Pacolet Manufacturing Company in February, 1917, an average deposit of $70 per family, or a saving per capita of $12.60.

On February 6, 1923, after an operation of five years and nine months, the books of the Employees' Savings Bank of Pacolet show that the average amount saved by every family of employees now is $395.88, while the savings per capita has increased from $12.60 to $70. The total savings of employees have advanced from $27,225.22 to $167,064.32, and instead of only one savings account for every ten employees, more than sixty per cent of the employees of the mill now possess savings accounts.

In addition, the employees of the Pacolet Manufacturing Company, who own every penny's worth of stock in the bank, have received total earnings of $53.93 for every share of $10. The capital stock of the bank now is only $10,000, and when the bank was organized was only $5,000. Basing calculations on the bank's original capitalization of $5,000, the Employees' Savings Bank's earnings have been as follows:

| (Par value, $10 per share) | |
|---|---|
| Paid per share in cash dividends | $ 8.30 |
| Paid per share in stock dividends | 10.00 |
| Surplus, profits and reserve, | 35.63 |
| Total | $53.93 |

What is of primary interest to the officials of the mill, the tendency of employees to leave Pacolet for other mill villages in the vicinity has disappeared. Pacolet has been converted, through the employment of landscape gardners, into an attractive textile town with well-paved streets, comfortable homes and various wholesome amusements. A community center has been established, and a nursery where women textile workers may leave their children in care of trained nurses has been provided. The earnings of the Pacolet Manufacturing Company compare with those of any textile manufacturing enterprise in the country, and the mill has never experienced labor trouble of any description. When the coal strike threatened to paralyze manufacturing enterprises some months ago, the employees of the village voluntarily offered to use wood as fuel in their homes in order that every pound of coal available might be used by the mill.

The Employees' Savings Bank of Pacolet was established March 15, 1917. A statement made public February 6, 1923, shows the following condition:

Resources—Loans and investments, $164,106.05; furniture and fixtures, $1,049.05; due from banks, $54,074.10. cash in vault, $5,996.23. Total resources, $255,225.83.

Liabilities—Capital stock, $10,000; surplus fund, $10,000; profits and reserve, $7,818.17; deposits, current accounts, $46,655.14; savings accounts, $75,980.50; certificates of deposit, $70,230.96; cashier's checks, $4,540.26. Total liabilities, $197,406.86.

In addition to the benefits accruing from the lesson in thrift taught by the bank, the Pacolet employees have learned something of investing their money intelligently. Many of them own building and loan stock, of which they hold more than 500 shares in companies located in the adjacent city of Spartanburg. Some employees invest a large portion of their incomes in maintaining children at college, a statement true of few textile workers. Mill officials have noted that the employees seem unwilling to invest in securities, being content apparently to receive an average return of five per cent, and at the same time to possess the privilege of being able to get their money at any time they may wish it.

The mere fact that the bank was established in the community did not inculcate in the employees the habits of thrift that President Montgomery wished to instill. Continuous propaganda concerning saving through the Y. M. C. A. general program of Thrift Week, picture slides at the local motion picture theater, printed matter on the back of pay-tickets, and Christmas Savings Clubs through the local school have assisted in encouraging the employees to save their money. The bank was merely a convenient place at which to start a savings account.

To stimulate the habit of saving among the children of the mill village, President Montgomery conceived the plan on December 23, 1919, of placing $1 to the credit of every child in Pacolet from school age, six years, up to sixteen years, and of placing an additional $5 to the credit of those children in the following groups who should save the largest amounts of money by the end of the year 1920:

Group 1—All girls in school under 14 years of age. Largest amount saved, $59.40.

Group 2—All boys in school under 14 years of age. Largest amount saved, $70.34.

Group 3—All girls in school 14-16 years of age, working part time. Largest amount saved, $90.

Group 4—All boys in school 14-16 years of age working part time. Largest amount saved, $92.44.

Group 5—All girls not in school 14-16 years working. Largest amount saved, $25.

Group 6—All boys not in school 14-16 years working. Largest amount saved, $63.44.

Group 7—All girls 14-16 years of age going to school first half of year and working the last half. Largest amount saved, $130.04.

Group 8—All boys 14-16 years of age going to school first half of year and working the last half. Largest amount saved, $212.20.

Five hundred dollars was placed to the credit of the children under this plan which yielded a total savings for the first year of $3,921.02, or nearly $8 per child.

Of first importance in connection with the development of the southern textile industry is the anonuncement made during the past month that a worsted mill will be constructed in the Piedmont section of South Carolina, to be known as the Southern Worsted Mills, with a capitalization of $1,100,000. Alester G. Furman & Co., of Greenville, S. C., are interested in the project, and it is reported that the Judson Mills, of Greenville, the Waterloo Woolen Mfg. Co., of Waterloo, N. Y., and Lockwood, Greene & Company are also interested.

A complete reorganization of the Waterloo Woolen Manufacturing Co., which is to be reincorporated under the name of the Waterloo Textile Corp., is included in the project, says the *Daily News Record*, of New York. A. M. Patterson, president of the Waterloo Woolen Mfg. Co., is to be treasurer of both concerns. E. M. Townsend, of E. M. Townsend & Co., will be president of the Waterloo Company. J. F. Syme, formerly of D. Goff & Sons, Pawtucket, R. I., will be manager of the plant, which will contain 120 looms, together with dyeing, spinning, and finishing machinery, it is stated.

The International Cotton Mills, of Boston, have purchased 100 acres of land adjoining their present plant at Hogansville, Ga., and it is reported they are considering the construction of a 40,000-spindle mill on the property.

The aviation field at Americus, Ga., abandoned by the Government, may be sold by the original owners under the terms of a bill introduced and put through the House by Representative Crisp and passed by the Senate on March 4. It is understood that New England cotton mill interests are anxious to acquire the property for the purpose of establishing a mill in Georgia.

Contract for erection of ten employees' residences has been let by the Anchor Duck Mills, Rome, Ga.

Fulton Bag & Cotton Mills, Atlanta, Ga., have purchased a 3500-kw extraction type, steam turbo-generator and switchboard. The power plant building has been completed ready for the installation of the unit. J. E. Sirrine & Co., Greenville, S. C., are the engineers.

The Swink Manufacturing Company, Salisbury, N. C., has been organized with W. J. Swink, of China Grove, and C. A. Cannon, of Concord, as the heads, for the construction of a new cotton mill and the construction of a town to be known as Swink, N. C., at a total cost of $2,000,000. The company has bought four hundred acres and necessary rights for power and sewer developments, it was stated. The new mill will be on the main line of the Southern Railway, six miles south of Salisbury.

The E. M. Holt Plaid Mills, Burlington, N. C., has had under construction for several months a large two-story brick building adjoining the mill. The new building covers an area of 50 x 144 feet, with a total floor space of 15,000 square feet. The new building is being erected for use by the finishing plant of the mill. A two-story office building adjoining the new building is in course of construction, and when completed will contain a reception hall, five rooms and a vault on the first floor, while the second floor will be used as a cafeteria.

The Aurora Cotton Mill, Burlington, N. C., will complete the electrification of the plant. The mill is at present partly motor driven and the remaining machinery mechanically driven by steam engine. Power will be purchased. They plan to build an office and storage building and to revamp the dye plant. J. E. Sirrine & Company are the engineers.

Announcement has been made that the Southern Manufacturing Company, Granite Falls, N. C., have begun operation on 12s to 30s single and ply yarns on tubes, cones and skeins. W. E. Poovey will be general superintendent, with H. C. Whisonant as general overseer.

Lockwood, Greene & Co., engineers, have closed contract with the Leward Cotton Mills, Inc., Worthville, N. C., covering services for doubling the size of the present plant, approximately 5,000 spindles in capacity. This work will include building extensions, enlargement of the village and the electrification of the present power plant.

The Locke Cotton Mills Co., Concord, N. C., have purchased 20 frames of roving machinery to be installed in their Buffalo plant.

Dudley Shoals Cotton Mill Co., Granite Falls, N. C., are installing new twisting and spinning machinery.

Cleghorn Mills, Rutherford, N. C., are erecting a number of new homes for operatives.

J. M. Odell Mfg. Co., Bynum, N. C., have placed contract for 2,048 Fales and Jenks spindles; and Foster cone winders will be added to the plant equipment.

Arista Mills Co., Winston-Salem, N. C., are adding new machinery in carding, spinning and weaving. At the Southside mill new looms are being added together with other equipment.

McAden Mills, McAdenville, N. C., plans general improvements and installation of additional machinery. R. R. Ray is manager.

An additional 6,000 spindles with accompanying machinery is to be installed by the Anderson Mills, Inc., Lincolnton, N. C. Thorne Clark is treasurer. The equipment to be added will double the capacity of the plant.

Caraleigh Mills Company, Raleigh, N. C., have let contract for ten three-room employees' homes. The Raleigh Cotton Mills have let a similar contract.

Sapona Cotton Mills, Cedar Falls, N. C., will install about 4,000 spindles, giving a total of about 11,850 when the installation is completed.

The carding machinery of the Florence Mills, Forest City, N. C., is being replaced with new equipment.

The plant of the Saxony Spinning Co., Lincolnton, N. C., will be doubled, it is reported. J. F. Love is president.

The Icard Cordage Co., Icard, N. C., will install 94 additional S K F ball bearing equipped braiders.

The Mooresville (N. C.) Cotton Mills Company have announced they will expand the plant immediately and increase the spindleage by 10,000 or more, with looms sufficient to care for the output. The machinery has been purchased, land has been acquired, contracts let for a mill building 600 x 125 feet, two warehouses and 100 dwellings.

Wade Mfg. Co., Wadesboro, N. C., have let contract for the erection of their 14,000 spindle—400 loom cotton mill to be built near Wadesboro. Robert & Company are the engineers.

Cabarrus Cotton Mills, Kannapolis, N. C., are erecting two apartment houses and a number of tenement houses for the use of the operatives.

Exposition Cotton Mills, Atlanta, Ga., are constructing an apartment house for operatives' use.

A 75-foot, two-story addition will be erected by the Brown Mfg. Co., Concord, N. C., for the housing of a modern dye plant to be installed.

Asheville Cotton Mills, Asheville, N. C., are re-arrang-

ing the machinery, replacing part of the old spinning equipment with new frames, and installing individual motor drive on spinning. New water and sewage facilities are planned. J. E. Sirrine & Co., are the engineers.

Georgia Cotton Mills, Griffin, Ga., are enlarging their bleaching plant. The company is also erecting an additional tank to hold 75,000 gallons of water and are boring three deep wells. Three wells now in use supply the bleaching plant now in operation, but the addition will require more water supply.

The Belton Cotton Mills Company, Summerville, Ga., has been organized with a capital of $200,000. J. M. Bellah is president, E. A. Leonard, vice-president, and A. C. Martin, secretary. Construction will start at an early date, it is reported.

The Amazon Cotton Mill, Thomaston, N. C., is erecting an addition and will install 8,000 spindles. The machinery will be re-arranged, using the present building for spinning and twisting and installing preparatory machinery in the new building, which will have motor drive throughout. J. E. Sirrine & Co., are the engineers.

Elk Cotton Mills, Fayetteville, Tenn., are enlarging the present mill, adding approximately 4,000 spindles and the necessary preparatory machinery and twister frames.

The Madeline Mills property, Chattanooga, Tenn., owned by the United Hosiery Mills Corp., has been purchased by the Standard-Coosa-Thatcher Company, according to an announcement by A. H. Thatcher. All existing machinery in the plant will be removed, since the property alone figured in the transaction.

An additional weave shed will be built by the Lancaster (S. C.) Cotton Mills to care for its coarser yarns that they expect to make into cloth.

A 20,000-spindle mill is to be built by the Arcadia Cotton Mills, Spartanburg, S. C.

The main offices of the Helen and Wymojo Yarn Mills, Rock Hill, S. C., will be removed to Gastonia, N. C., according to an announcement by W. R. Armstrong, president and treasurer.

The Victor plant of the Victor-Monaghan Co., at Greer, S. C., is building a four-story addition and will add about 120 looms and spooling, warping and slashing equipment. The mill will also re-arrange the machinery in Mills No. 1 and No. 2, installing motor drive. J. E. Sirrine & Company are the engineers.

Beaumont Manufacturing Co., Spartanburg, S. C., is to install 450 new looms in the new two-story and basement building being erected. About 186 looms will be moved from the present mill. Re-arrangement of machinery in Mills 1 and 2 will be made and 9,000 spindles added. J. E. Sirrine & Co., engineers, are in charge of the work.

Pelzer Manufacturing Co., Pelzer, S. C., are planning on a central heating plant to supply heat to the auditorium, high school, grammar school and moving picture theatre. Contract for building the grammar school and theatre has been let. J. E. Sirrine & Company are the engineers.

Martel Mills, Inc., are to build an addition to the Palmetto Plant, at Columbia, S. C., which will add about one-third to its present capacity.

It is reported the Grendel Mills No. 2 are to build at 12,000-spindle addition.

Cherokee Spinning Co., Knoxville, Tenn., have recently awarded contracts for the humidifying, heating, process piping, and fire protection systems all in a general contract, to the Parks-Cramer Co., Charlotte, N. C. The humidifier system is to be of the latest improved "High-Duty" type, complete with automatic humidity regulation. The process piping includes the complete layout for the slashers, dyeing and finishing machinery. The fire protection layout will be the regular standard inside installation with a very extensive system of underground yard mains. The heating system is of the latest vacuum type. The whole complete piping installation being handled as a unit.

Contracts have been let to Parks-Cramer Co., Charlotte, N. C., for the fire protection and humidifying equipment at the new plant of the Republic Cotton Mills, at Great Falls, S. C. Installation of this equipment will probably be made during the summer months.

Ground has been broken for a $2,000,000 cotton mill to be built near Tulsa, Oklahoma, one of the largest cities in the state of Oklahoma. The capital is being furnished by a man said to be one of the largest and most successful oil producers in the state, and it is understood that the product is to be merchandised by Amory, Browne & Co. The construction and operation of the plant has been placed wholly in the hands of W. C. Summersby, who, since returning from France, has been superintendent of the Boston Manufacturing Co., at Waltham, Mass.

Itasca Cotton Mfg. Co., Itasca, Texas, is erecting an addition to its mill to house fifty additional looms, giving the mill a total of 375 looms. The plant has 10,000 spindles.

The Dallas Mills Co., Dallas, Texas, has been organized with a capital of $1,000,000, and will manufacture duck, denim, and coarse sheetings. A mill of 12,500 spindles and sufficient looms will be constructed. The organization of this company is the direct outcome of the visit of M. L. Cannon, of Concord, N. C., and L. W. Robert, Jr., of Robert & Co., Atlanta, Ga.

A company with a capital stock of $400,000 is being formed at Mesquite, Texas, for the establishment of a cotton mill. The company is to be incorporated under the name of The Mesquite Textile Mills Company, with 5,000 spindles. S. R. Marshall, of Mesquite, is president; J. C. Rugel, vice-president, and John S. Lawrence, mayor of Mesquite, is secretary. The directors are M. L. Cannon, Concord, N. C., L. W. Robert, Jr., Atlanta, Ga.; I. N. Range, Harry Williams, M. C. Snyder, S. D. Lawrence, J. D. Chapman, and the officers of the company.

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Statistics on cotton production and trade for the cotton-growing countries of the world are contained in a book recently published by John Heywood, Ltd., 121, Deansgate, Manchester, England, under the title "The Cotton Growing Countries." The information was compiled by the International Institute of Agriculture, Rome, by means of a special questionnaire addressed to each government in question, inquiring as to their production and trade. The information thus collected appears in this publication, in conjunction with other available material.

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"In the Cause of World Cleanliness," is the title of an attractive book issued by the American Laundry Machinery Company, with headquarters in Cincinnati, Ohio, pointing out the growth of the laundry industry in the United States and Canada, and showing views of processes in the manufacture of laundry machinery produced by them.

## The New England Mill Situation.

Production in New England mills is generally at capacity levels measured by the available supply of operatives. The mills that were hampered by strikes last year are pretty well back in running order, the gains of the past two months having been very steady.

The proposed short hour legislation in New Hampshire was defeated in the Senate by a close vote and the matter cannot come up again, in the legislature at least, for another two years. In Rhode Island, after long sparring in committee, a bill has been introduced into the lower house and is now in process of discussion. In Massachusetts, a strong fight was made to revoke the 48-hour law on the books but nothing in this direction can be accomplished.

The beginning of the hearings for a reduction of municipal assessments on mills in Fall River occurred this month and the matter is expected to drag for weeks. At the moment, the case of the King Philip mills in that city is under consideration before a commissioner. Many other cases are to come up in regular order. A basis of $18.25 per spindle was adopted by the assessors acting on valuations of mill properties, and because of the high rates, the municipal tax bills in that center and throughout Massachusetts, are very heavy. In some cases the mills are taxed 7 per cent of their capitalization, for local taxation purposes.

Wage matters are seething in some sections. At Fall River, and some other smaller centers, demands have already been formulated by unions and presented to manufacturers. The latter are gravely in doubt as to whether they may not be forced to advance, or at least to make some compromise. The United Textile Workers, a Federation of Labor union, demand a restoration of war time schedules, which would mean an advance of 29 per cent.

The Federation of Textile Operatives, largely a New England federation, and centering in the Textile Council of Fall River, have arranged a conference with manufacturers to take place about March 15, and the whole subject will be gone over. The Federation of Labor unionists have already been refused their requests and are threatening to strike beginning March 19. It is not believed among manufacturers that this threatened trouble will get very far. The general temper of the public in Fall River is against any radical strike action and in this respect it is different from the popular opinion current in other New England centers a year ago.

New Bedford and other textile centers are awaiting action by the Fall River manufacturers. There have been some demands made upon the Naumkeag Mills at Salem, Mass., and it is also stated that uneasiness prevails among workers in the woolen mill districts of Lawrence. It is generally felt among manufacturers that some wage concession will have to be made to maintain steady production, but nothing like a restoration of war time wages will be granted.

Merchants handling cloths are greatly bothered by the wage situation in New England. Owing to the high price of cotton they have been forced to advance prices for goods to levels that imperil their steady and profitable distribution during the life of the current cotton year. But as some had cotton in hand and others are moderately well supplied, they have averaged up prices in accordance with the stocks of lower priced cotton they may have had in hand.

If wages are advanced, it will be necessary to meet the advancing costs immediately through higher cloth prices. Buyers of goods are already resisting recent advances on many lines and merchants are urging upon their mill clients that further price uplifts may bring about a decided restriction in cloth consumption.

Most manufacturers are quite as apprehensive on this score as many of the merchants, yet they do not see how they are going to avoid the wage advances. The winter has been a very hard one in New England. Coal has been scarce and very high. Rents have continued very high, and owing to the many impediments to quick transportation, many living costs have been relatively high. The rise in prices as shown in index figures of various sorts have seemed to indicate higher living costs, and this basis of arguments is against the mill men. On the other hand, the savings bank figures in New England indicate that the operatives are piling up money, and through full employment, their actual earnings are very high. Recent evidence showed that in a mill of 1,100 people, the average wages paid reached $20 per week per employee. This is nearly $11 a week above the average prevailing ten years ago.

Throughout New England for the past two months public attention has been turned toward the fact that very few new enterprises of a textile character are being launched and not many additions are being planned. On the other hand, activity in the middle and southern states is very great. The constant restrictions imposed upon New England industry are finally driving investors away and are tending to chill the interest of those who have established investments in the section. Some change in public sentiment toward industry is being aroused but the work has been done, and the most that can be said is that the general public has reached the point where it will not peacefully tolerate the establishment of a battleground in New England for further social reforms of a local character.

The markets have continued favorable. Profit margins are still narrow based upon replacement costs and many mills are unwilling to sell very far ahead at current prices. On goods for fall delivery, such as ginghams, napped goods, and some others, the business booked has been accepted at close prices because of cotton being in hand below current market levels.

All of the gingham mills have named fall prices and they report that they have sold up their product. Amoskeag prices for fall were a source of surprise as they continued most of the spring prices on what amounted to four-fifths of their product, and advanced other prices between ½ cent to 1 cent a yard. They also granted fall dating on bills. This action provoked comment, as only one other large house followed this policy—Lawrence & Co., on Whittenton ginghams—while all the southern mills had sold their goods on a 2-10-60 basis. Next spring, the jobbers will press their requests for the general adoption of a fall and spring dating policy, such as prevails on some other lines.

The business done on napped goods, especially the lighter weights, has been eminently satisfactory, the larger producers having sold up and withdrawn all flannellettes, domets, etc. The blanket business has not been relatively so good, as wool blankets have been priced attractively, and it is not so easy as it used to be to induce jobbers to order blankets months ahead in large volume. At the same

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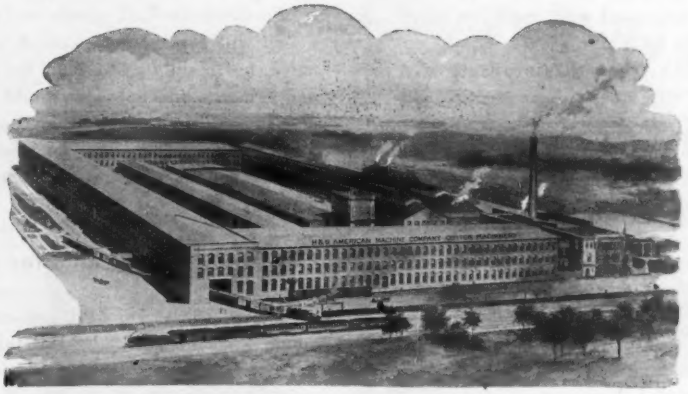

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time the sales have been ample to care for a full summer output.

The wide sheeting markets have held firm, especially on all the wide numbers. Advances are expected at any time to a basis of 72 cents for 10-4 goods, from 65 cents, where they have been for some time, and just where they were a year ago when cotton was 10 cents a pound cheaper. All of the wide sheeting mills have some departments running overtime.

The markets have been better of late on 4-4 bleached cottons, especially on some of the better known brands. But prices have been too close to give converters much of a chance, the large factors being able to get the business on close margins quite satisfactory to them. Competition in bleaching is growing very fast, and it will certainly not be helped by the larger additions being made and now contemplated in the South.

Percales have been selling moderately on a basis of 15 cents for 4-4 64 x 60s. Some new styles are appearing, and many Egyptian colorings are being shown. The large printers continue running in full.

Finishing plants are still not running to capacity but they are doing better than a month ago. Logwood black plants are operating less than half, but the piece dyeing, bleaching, and printing plants have been making steady gains and as a whole are now doing an average of 80 per cent capacity.

Business on bedspreads has been quite full and the large mills are fully occupied. Some of them are turning out large quantities of colored bedspreads in crochet and satin weaves and the market is taking them freely. Fancy towel business has been better of late. Damasks are also better sold than they were.

Wash fabrics have been greatly affected by the sudden change in styles consequent upon the craze for anything suggestive of Tutankhamen's tomb. Egyptian, Indian, and Far Eastern style suggestions of all kinds have led to demands for rush orders from printers. Many cloths are being printed with these new motifs and colorings. Ratines, voiles, and crepes lead, but many other goods available for immediate processing are being finished to meet the broadening demand. This trend to novelties has limited the sales of many of the printed lawns, and some of the ginghams, but as, at best, the matter of a style craze is not lasting, the handlers of the more staple lines are convinced that they will sell all they can make.

Business on printed draperies continues large. Many heavy southern goods are being printed for the new season, and many silk, artificial silk, and other mixed goods are being used. Fine combed goods have not done as well as some of the other numbers, although fine sateens are still very well sold and shirtings are in constant deamnd.

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Of interest to dyers is a volume recently published entitled "Synthetic Coloring Matters—Vat Colors," written by J. F. Thorpe, professor or organic chemistry, and C. K. Ingold, lecturer in organic chemistry, at the Imperial College of Science and Technology, South Kensington, England. This is one of a series of monographs on industrial chemistry whose purpose is the showing of examples of the application of recent conceptions and doctrines to the practice in modern manufacturing procedure. The book is published by Longmans, Green & Co., 55 Fifth Avenue, New York City.

## Cotton Comment.

BY H. & B. BEER.

New Orleans, March 10, 1923.

In keeping with our expectations, as expressed in our review one month ago, the cotton market has experienced a further sharp advance, recently values rising to the highest levels of the season, middling spots in the local market having sold at 31 cents compared with 28.63 one month ago, and are quoted today at 30.75.

During the past month the world's available of American cotton, exclusive of mill stocks, decreased 789,000 bales vs. 538,000 last year.

The status of the cotton situation today is as follows:

| American Cotton | This year | Last year |
|---|---|---|
| Remaining to be marketed | 2,175,000 | 4,454,000 |
| World's visible supply | 2,459,000 | 3,605,000 |
| World's available today | 4,634,000 | 8,059,000 |
| World's available one month ago | 5,423,000 | 8,597,000 |

Spinners continue to take freely of the American product, having taken 194,000 bales the past week vs. 184,000 last year. After this time last year takings by spinners of the world amounted to 4,039,000, if they take as much during the remainder of this season as they took after this time last season, the world's carry over of American at the close of next July, exclusive of mill stocks, would be only about 595,000 vs. 4,020,000 last year, which shows what is in store for the trade next summer, or long before the new crop begins to move to market in volume.

It is evident, therefore, because of the smallness of the port and interior stocks, and the country having less than half of last year's cotton to market, that it will probably be difficult to buy spot cotton in volume in the future except, perhaps, at higher prices.

While England has been virtually out of the market of late, buying by Japan, Italy and Spain has been active, especially in Texas. As a result stocks in Texas have been reduced to a minimum, to less than last season, notwithstanding this season's crop in that state to have been about 1,000,000 bales larger than last season's.

However, hope is entertained for the making of a large crop this year to provide for next season's requirements and to replenish stocks the world over, and as the high price this year will be the incentive for efforts to grow a larger crop this year, the South will likely endeavor to make hay while the sun shines.

As regards the contemplated acreage, early returns to a prominent Texas house indicate an average increase for the whole belt of 10.4 per cent compared with last year's area of 34,852,000, promising an acreage this year of about 38,476,000.

Official report of sales of fertilizer in eight cotton states for 7 months ending with the close of February show that 1,340,039 tons were sold for the period this year vs. only 540,743 last year, 656,328 in 1921 and 1,854,777 in 1920.

During the past week the government experimental station at Tallulah, La., reported that only 19 weevil, per ton of moss, survived the winter vs. 127 last year, 22 in 1921 and 10 in the previous big crop year of 1920, when a yield of 13,271,000 was obtained.

Therefore, it will be seen by these returns that prospects for the making of a larger crop this year are exceedingly encouraging compared with results last year, but by comparison with 1920 the outlook is not so bright, for while the acreage promises to be somewhat larger than three years ago, it is noted that sales of fertilizer so far are smaller than that year, that the weevils cover a larger area than ever before, while it is generally admitted that there is a shortage of labor in the eastern half of the belt this year.

Furthermore final results as to damage this year by the weevil will depend not so much on the number that hibernated, but mainly as to what the propagation next summer and fall will be since they would probably multiply by the million under certain weather conditions, such as cloudy or wet weather. Therefore the weather in its relation to the next crop and and effect on weevil eventually is becoming more of a market factor.

## Summer School for Mill Teachers.

Beginning on June 25, and continuing for six weeks, a summer school will be held at the Georgia School of Technology, Atlanta, for further training teachers in mill schools. Special emphasis will be placed upon the preparation of part-time teachers, all-day teachers of regular day schools situated in mill communities, social workers and ambitious employees in textile mills who desire a greater vision and preparation for leadership.

A comprehensive course of study is planned, which has a number of definite objectives, among these being to secure the interest of young teachers with right social attitudes and good fundamental training; to offer a program for definite training of teachers in textile communities; and to provide for some definite training in mill operations as a basis for an instructional program. This last named object, together with the school's purpose to furnish the all-day teachers in mill schools an industrial background and social attitude beneficial to her, and to provide an industrial background and educational point of view for social workers that they may be able to coordinate their activities with those of the school, is important.

A study of mill mathematics and calculations, as they affect the worker, and ninety hours work in The A. French Textile School, will constitute a part of the study course, eighteen hours of intensive work being spent in each of the carding, spinning, weaving, fabric analysis and knitting departments.

One important feature pointed out in connection with this summer school is that with the regular requirements being fulfilled, credits will be granted in the usual manner for summer school work to the teachers completing the course.

Other features of the proposed school make it appear mighty interesting. There will be no matriculation fee connected with the course, the only expenses being the cost of lodging and board while attending the school, and arrangements are being made for provisions to reduce this cost to a nominal sum by the use of the school's dormitory buildings.

Anyone desiring further information concerning the school and details of its course of study may secure this by writing to J. F. Cannon, care of the Georgia School of Technology, Atlanta, Ga. The school will be conducted under the Federal Board for Vocational Education.

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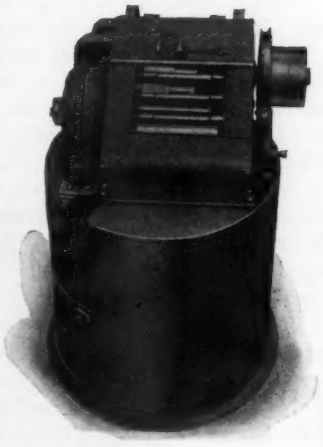

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# Notes About Men You Know.

E. R. LEHMAN, formerly overseer of carding at the Shawmut Mill of the West Point (Ga.) Manufacturing Company, has been made assistant superintendent of the Dixie Cotton Mills, La Grange, Ga.

I. B. COVINGTON, superintendent of the Florence Mills, Forest City, N. C., has resigned that position and will take charge of the new Wade Manufacturing Company, at Wadesboro, N. C., as general manager.

JOHN D. COMER, vice-president of the Bibb Manufacturing Company, Macon, Ga., and one of Georgia's leading financiers, died at his Macon home on March 14th, death being due to a complication of influenza and pneumonia. Mr. Comer was born on October 15, 1884. He became associated with the Bibb Manufacturing Company eleven years ago.

B. OLNEY HOUGH, for many years past editor of the American Exporter, has relinquished that position to establish himself as export counselor, consultant and adviser to banks, exporters, and manufacturers, with offices under the style of B. Olney Hough, Inc., 17 Battery Place, New York. Mr. Hough enjoys the unique advantage of having had an exceedingly and uncommonly varied and comprehensive experience in every phase of business life. He has been salesman, both domestic and foreign; manager and buyer for manufacturing plants; an export merchant and has traveled widely all around the world, having an intimate business acquaintance with most of the world's great markets.

D. R. HINKLE has resigned as superintendent of the Kinston Cotton Mill, Kinston, N. C., and is now superintendent of the Hickory Spinning Company, at Hickory, N. C.

D. E. C. CLOUGH, formerly overseer of carding and spinning at the Avondale Cotton Mill, Humbolt, Tenn., is now overseer of carding, spinning, twisting, winding and reeling at the O-Cedar Cotton Mill, Covington, Tenn.

T. CROWE has resigned his position with the Goodyear Mills, Goodyear, Conn., and taken a place at the Mount Hope Branch of the Manhasset Mfg. Co., Warren, R. I. On his departure from Goodyear, the help there presented Mr. Crowe with a purse of gold.

A. L. RANDOLPH, formerly at Columbus, Ga., has been made assistant to John L. Dabbs, southern manager, E. I. du Pont de Nemours & Co., Charlotte, N. C. A. F. Black has been transferred from Western North Carolina to Georgia with headquarters at Columbus.

THOMAS KINNEY, superintendent of the Princeton Cotton Mills, was almost instantly killed recently when he came in contact with a high tension electric power wire at the plant. Mr. Kinney was 28 years of age.

J. R. DUNSON, of La Grange, has become assistant treasurer and agent of the W. A. Handley Manufacturing Company, at Roanoke, Ala., which has been purchased by eastern interests and will be reorganized for operation at an early date. Mr. Dunson was connected with The Dixie Cotton Mills, La Grange, for about three years prior to becoming associated with the Dunson Mills, with which he has been connected for about ten years. He was secretary and assistant treasurer of the company.

HENRY W. PAPPA, it is reported, has been made general manager of the Hampton (Ga.) Cotton Mills, succeeding R. M. Harris.

PAUL R. CHAPMAN is president of the Forsyth Hosiery Mills, the position held by his late father.

J. O. EDWARDS has taken charge of the Icemorlee and Everett Mills, at Monroe, N. C., beginning March 1. Mr. Edwards for a number of years has been general overseer of carding at the Lancaster Cotton Mills, Lancaster, S. C. He is a member of the board of governors of the Southern Textile Association, and is an active member in the association's discussion work.

CHARLES O. EDWARDS has been made overseer of weaving, slashing and drawing-in at the Social Circle (Ga.) Cotton Mills.

JOHN HUNT has become overseer of carding at the Adams Cotton Mill, Macon, Ga., succeeding J. C. Pressley, resigned.

E. C. GWALTNEY, formerly at the Demopolis (Ala.) Mills, has succeeded D. R. Hinkle as superintendent of the Kinston (N. C.) Cotton Mills.

CHARLES H. FISH has been appointed general manager of the Imperial Cotton Mills Company, Los Angeles, California. Mr. Fish is a former president of the National Association of Cotton Manufacturers, and has for several years maintained offices in Boston as a consulting mill engineer. Mr. Fish was agent of the Cocheco Mfg. Co., Dover, N. H., for several years, and was later general manager of B. B. & R. Knight, Inc., Providence, R. I., and the Garner Print Works and Bleachery.

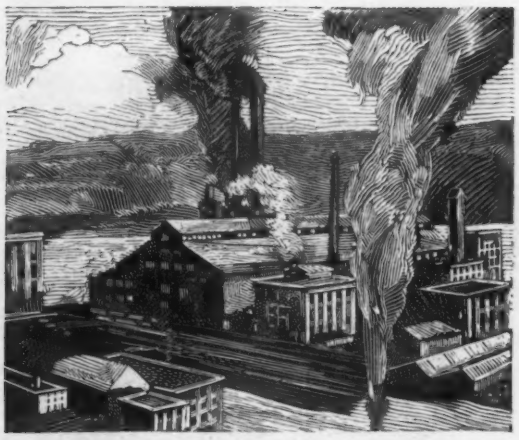
CHARLES A. SWEET, SR., for many years connected with the Fulton Bag & Cotton Mills, Atlanta, and the Maginnis Mills, New Orleans, La., as agent, died of pneumonia in New York on February 12.

WALTER SMITH, overseer carding at the Standard-Coosa-Thatcher Company, Piedmont, Ala., died on February 19th. Mr. Smith had been with this company for over 30 years, having come from their mills in Delaware when the Coosa Mfg. Co., was started at Piedmont.

J. H. BAGWELL, formerly assistant sales manager for the southern division of the U. S. Oil Company, has become superintendent of the Art Cloth Mills, Gastonia, N. C.

JOSEPH H. ZENS, president of the National Association of Hosiery and Underwear Manufacturers, has accepetd the position of general manager of the United Hosiery Mills Corporation, Chattanooga, Tenn., having already gone to Chattanooga to assume charge of the manufacturing duties at the plants there. It is stated further that Mr. Zens will remain as president of the Milwaukee Hosiery Company, at Milwaukee, Wis., which position he has held for some time.

JOHN W. CLARK, president of the Southern Textile Association, has resigned as superintendent of the Erwin Bleachery, at West Durham, N. C., to become president and general manager of the Randolph Mfg. Co., and the Franklinville Mfg. Co., at Franklinville, N. C., recently re-organized as Randolph Mills, Inc.



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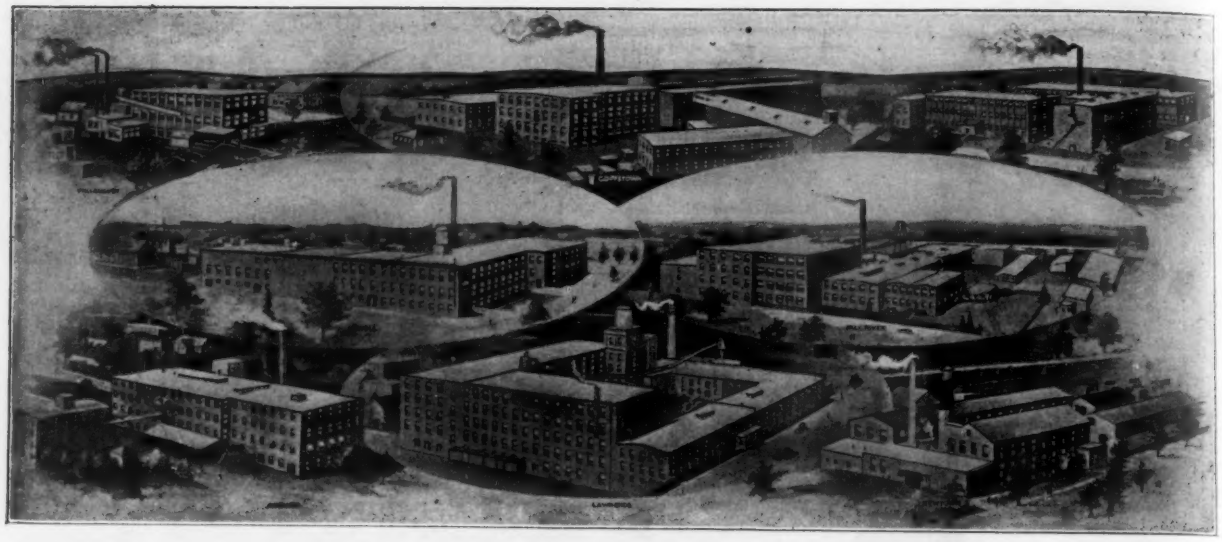

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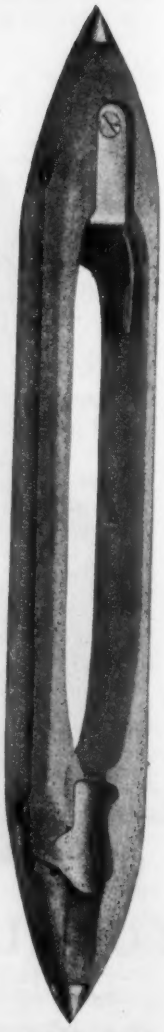
Automatic loom users who have not already adopted our remarkable new "S EYE Automatic Shuttle" have only to try it, as a trial has convinced the most skeptical that it is the best automatic shuttle ever made for any kind of automatic loom. Several loom builders have approved the "S Eye" Shuttle, realizing that its simplicity, ease in positive threading, uniform tension and freedom from unthreading, misthreads, mispicks and broken picks are good reasons why a weaver of first quality can afford to use no other.

A sample of any U S product will be gladly sent on approval. Ask today for catalog.



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# An Old Timer Says

When you seem to have that tired feeling, when you are just a little blue, when time seems to drag—get out into your room and if you have nothing special in mind to do, just put your hands in your pockets and start walking up one alley and down the next. Not back alleys, but the alleys the operatives work in. Stop and ask the speeder hand, the spinner or the weaver how his work is running, how much he is going to make this week, whether or not he is saving any money—and the first thing you know you are finding so many things to do that the whistle blows before you realize it and it's stopping time.

In fact, this is one of the very best plans for an overseer to get right close to his job and know how everything is going.

Very few overseers go into the operatives' alleys enough anyway. Many of your operatives you have probably never had a conversation with. Maybe he has a brother, a cousin or a pal on the farm this year that you didn't know about. Get his address. Maybe you'll need him some of these days.

If you do, write and tell him how well his brother is getting along working for you. Estimate how many dollars per year the man working for you will make, and then divide that amount by the price of a bale of cotton and ask him if he is going to make that many bales this year. Or if they both have families, estimate how much the whole family make at the mill, then make the same comparison.

The more people an overseer or a superintendent knows, the better chance he has of filling a place when he has a vacancy. If that is a fact, then why not always be doing something to get in touch with more people? You couldn't do a better thing than to find out how many kinfolks the operatives working for you have. Make a list of them and see if you are not surprised.

The man who keeps his mind occupied, the man who is always reasonably busy, is not only the most contented, but is always the most successful. If you want to keep your section men contented, *keep them busy.*

The man who does just enough to get his job started up in the morning and then pulls out for his desk to sit down, is the man you will always find with a "grouch." He is generally complaining about his hard job or that the boss won't let him do this or that and he even gets mad when an operative comes to his office to ask him something.

Now before you say this reasoning doesn't apply to you, suppose you start in tomorrow and see how many times you can catch yourself doing absolutely nothing, then remember what "Old-Timer" says—that the man who is always doing something is much happier than the man who never has much to do.

Yes, I know most overseers and superintendents will say, "My work is in fine shape; my production is at the top; and my cost has gone down in a deep well. What is there for me to do?"

Great Scott! Get out and find something to do. If you are so "stuck up" that you think everything in your room or mill is 100 per cent right, a blamed good thing for you to do is to get into your "Tin Lizzie" and journey over to see your friend's mill or room. Go there with the determination that you will make a mental note of everything you see that you could improve upon. Suppose you number them. The first thing you see, just say to yourself, "That is number one;" the next, number two, and so on. You can remember them better by using this method, then when you get away from the mill, take out your notebook and write every item down while they are fresh in your mind.

Then tomorrow, go into your own room or mill and give it this same kind of a rigid inspection and I think you will find enough work to last you about six months. At any rate, if you can find twelve or fifteen items in his room or mill which you could improve upon, *very likely* your friend could come to your room or mill and find just as many.

Confound it, can't you "see the pint?"

If you are getting tired of your job, and think you would like to move out on the farm, or that everybody else has a better job than you have, it's because you are getting lazy. Snap out of it! Get a little of that old-time "pep" you had *when you first took the job.* Remember how happy you were; you just felt like you couldn't do enough in one day. Get that feeling again and you will see that this is a good old world after all and that life is worth living. Your future will begin to look brighter, your wife and kids won't know what in the world has happened to Dad, and incidentally, you will find out that you have got one of the best jobs in the country and that job has got a darn good man to run it.

---

Keep constantly saying to yourself: I am going to run my job better. I am going to prove myself more valuable to my employer. Then do it. And that better job will soon show up.

---

We build our future an inch at a time. Do you realize that fact?

---

Why not wake up, put a little "pep" into your life, be somebody, and see how much more you will enjoy life.

---

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## The Stimulus of COSTS

A manufacturer of a general utility product in the Middle West—very small and fighting for his life some years ago—is a retired millionaire today. With very limited capital and little knowledge of the field, he took over a failure, worked out a practical system of Costs and made a fortune. To his determination to *know his Costs* he attributes his success. Of Costs as a stimulating influence to success he has this to say:

"Every department should feel the force and the impetus of the Costs system so that all will constantly cry out for more knowledge. This more knowledge is a wonderful stimulus—an inspiration. It permeates the entire institution, cheapening the cost of operation, enhancing the quality of the product, insuring the greatest profit. The chief executive should be interested in Costs, no more and no less than the humblest foreman in the least important department. As all will not be equally interested in the same facts, the accountant must so adapt the Costs system that some part of the facts and figures presented will specially interest every official of every department whatever his capacity.

"Hence there are Costs and Costs. Which one, or what kind, depends upon whom and what purpose it is to serve. The cost of the right system itself will always be small compared with the results gained, but it must be the *right system*. If not it is worse than useless. It will be like a perfectly good guide-post turned, by some mischance, to point the wrong road.

"A *right* Costs system must be founded on sound and fundamental principles of accounting—on facts based on accurate figures."

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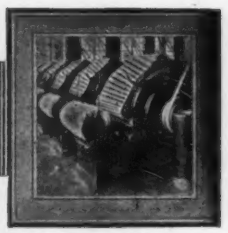
# How Other Men Manage

## Practical Discussions by Cotton's Readers on all varieties of Mill Subjects



**We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.**

### Suggest Some Goods for This Man.

EDITOR COTTON:

I am desirous of securing the constructions of any styles of goods that can be made from yarns not lighter than 9s, preferably made of yarns 4s to 8s. What I am looking for is a style of goods something similar to husking cloth, crash toweling or osnaburg made of white cotton or all cotton. I understand that husking cloth and crash towelings are made in 22 and 36-inch widths respecticely, and although we can make these widths on a 40-inch loom we would of course prefer a wider style of goods which could be made with yarns from 4s to 9s.

I shall be glad to have any of your readers who can give any information on this to do so through your Discussion Department columns.

Contributor No. 42.

### The Duplex Carding Device.

EDITOR COTTON:

For the benefit of "Nero (N. C.)," whose question appeared in the February issue, and others, I will deseribe briefly the duplex carding device.

This device consists of one or two rolls covered with special clothing and placed underneath the licker-in, revolving slowly in the same direction as the licker-in. A doffing comb placed in front of the roller removes the substances which the rolls eliminate from the surface of the licker-in, which then fall to the floor amongst the droppings.

The device has no high speeded parts to cause wear and is so simple that derangement is impossible. It consequently requires very little attention.

The object is to remove motes, leaf, short fiber, and foreign substances from the cotton before it reaches the cylinders and flats. This naturally increases the life of the card clothing, as it is not being subjected to as rough usage as would be the case if the substances removed by the duplex device were allowed to pass on to the cylinder and flats, besides which the clothing is at all times in much better condition to give superior carding and requires much less grinding.

That is why I am a warm advocate of this device. In mills where the cards are pushed to the limit and it is necessary to strip four times a day, the duplex removes much of the load. With the duplex device, I have always produced a much better quality of roving and yarn. With this device, without altering the card settings, the amount of waste taken out may be varied considerably, according to the class of cotton and quality of work desired.

"Nero" puts the following questions: "Can't we get a better grade of product with the duplex? What is the best setting on the duplex to get the greatest percentage?"

There is not one carder or grinder but who will admit that dirty stock will rob the fine point on the wire. Therefore, any device that will remove foreign substances from the cotton, before it reaches the cylinder and flats, will improve the quality of the carding, and will also increase the life of the card clothing. By reducing the frequent stripping the production is increased also. In answer to his question as to the best setting, I would say that the rolls should be set to the licker-in at .007 gauge. The percentage is obtained by changing the sprocket gears.

Gears are sent to regulate the amount of duplex waste by decreasing or increasing the surface speed of the duplex rolls.

Duplex rolls should be cleaned thoroughly when the card is ground. A hand card should be used. The only trouble I ever experienced with this device has been in the derangement of the oil tubes. These should be watched at all times.

"Nero" also wishes to know "why more mills don't use the duplex?" My answer is, for the same reason that some mills don't use humidifiers or Crighton openers. There are hundreds of mills using the duplex device. I doubt if you will find a waste mill without one, and because of this, many men have the idea that the device is useless in fine goods mills. However, if a man will examine the foreign matter taken out by these rolls, he will want the system immediately.

Wash (R. I.)

### Drawing Frames.

EDITOR COTTON:

Drawing frames are considered by a great many carders to be the simplest machines in the carding department—they don't seem to give but little attention to them. I cannot see why drawing frames are called simple. They are very simple to operate, I must admit, but they must be operated properly, if not, very bad and uneven work will be produced. Often when a carder has new help to break in, he puts them on the drawing, thinking that the work is simple and does not require a skilled hand to operate them. But if he should stop and consider that all the stock passes

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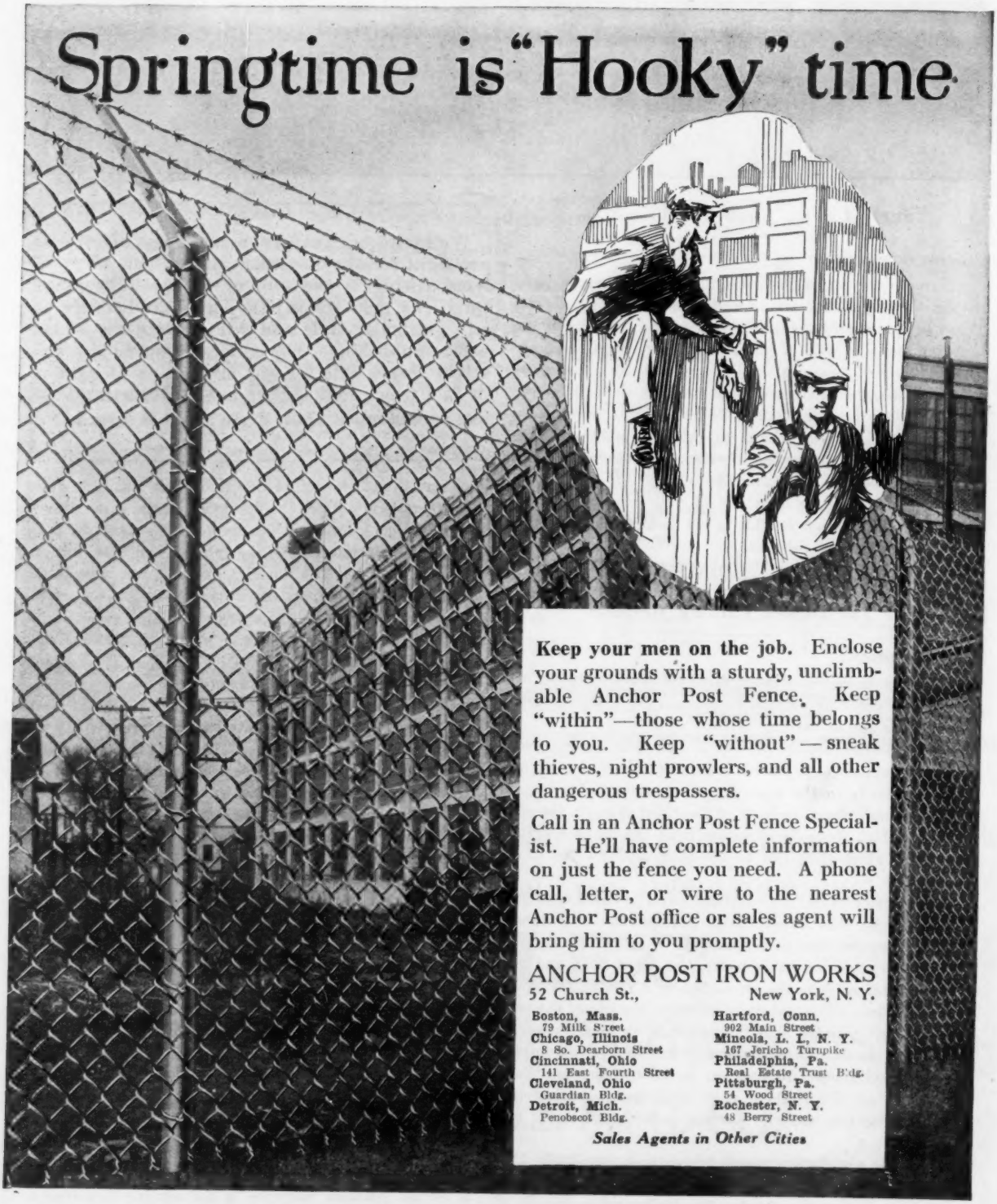

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FIRM—BECAUSE THEY ARE ANCHORED

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through the drawing he would readily understand that it is not a process to be ignored as being unimportant. A drawing tender should be a competent man. Of course, I am well aware that in many mills the wages are smaller on drawing than other machines in the carding department, and for that reason a good competent man cannot be hired for the position. But I believe that the wages should be high enough to enable the overseer to hire just as good help for drawing as any other machine in the mill. *Why not?* We all know the result from singlings and doublings which are let go by a boy drawing tender. We cannot stand and watch them all the time. Just think of all the weak and uneven yarn that can be made through a careless drawing tender letting a whole lot of singling go through to the slubber and other machines. It may be only a very little, but think how that little singling will increase its length by the time it reaches the spinning frames. The carder will find that it pays to look after the drawing just as much as any other machine in the department. He should see that the top rolls are in good condition, and that they are kept varnished if leather rolls are used, and also see that they are weighted properly, and above all, see that the rolls are set properly for the staple he is using. He must look out for the stop motions and see that they stop before the end runs through.

To illustrate the important part that drawing has in the carding department, let me give my experience in a mill of about 24,000 spindles. I accepted the position as overseer of carding, and on the very first day I noticed that the drawing was running "tough." I began to investigate and soon found where the trouble was. The drawing frames were in the worst condition I ever saw; every end would run through into the can before the drawing would stop, and the top rolls had but very little varnish, the rolls were set for about 1½-inch staple cotton whereas they should have been set for 1¼-inch stock. The weights were all mixed up, and the front roll was running over 400 r. p. m. I sized those drawings and I could get almost any weight per yard but the right weight. I had not been working long when the overseer of spinning came to talk with me, and I asked him how the frames were running. "Very poorly," he replied. "Why, the yarn doesn't break anywhere near standard, we have tried everything to improve it, but don't seem to strike the right thing."

I started at once to put the drawing in proper condition; I first scoured them, and varnished every roll, and put in many new ones to replace those on which the leather was loose. I could see that the carder before me had neglected his drawing frames, and had given no attention to them whatever.

After making all these improvements on the drawing, we were surprised at the change in the breaking strength of the yarn. Since that experience I have been very strict with my drawing tenders, and look after them as much as any other hands in my department. My advice to all carders is: Watch the drawing frames, and you will see results all through the mill.

What we are all after in the spinning and weaving is a better product, as was stated at one of the practical discussions of the Southern Textile Association reported in the November issue of Cotton. And unless we carders look after every machine in our department, we cannot get good results, and have better goods. No machine should be neglected, so let's all unite and do our very best to reach that aim of better goods. This can be done if we have the right stock to start with at the picker, stock that will be equal to the numbers; this is the trouble in a good many cases.

Experience (Conn.)

## What Makes Lumpy Slubber Roving?

Editor Cotton:

I am having trouble with my slubber roving. It is lumpy, showing thick and thin places in it. I would like to have "Wash" and several other old-timers give me their views on the situation. Following is my "hang-up."

Front roll diameter, 1¼ inches.
Middle roll diameter, 1⅛ inches.
Back roll diameter, 1¼ inches.
Front roll weight, 18 pounds.
Middle roll weight, 14 pounds.
Back roll weight, 10 pounds.
Front roll, set to middle, 1⅞ inches.
Middle roll, set to back, 1½ inches.
Length of staple, 1 inch.
Weight of finished drawing, 80 grains.

What about the roll settings? The weights on the rolls? The weight of the sliver? I wish your readers would examine the weights on their frames, also the weight of the drawing sliver, and give me a comparison. I am making .40 and .50 hank slubber roving. Will it cause thick and thin places to run the sliver down through the hole in the side of the flyer instead of wrapping around the top before it goes down through the tube? Has anyone tried it both ways? I run mine straight down instead of wrapping it around the flyer top, as my flyers have two holes for the sliver to pass through, one on each side.

I am sending this S O S for results; not as a joke or just to hear myself talk. Y. T. (Ala.)

## Fly Frame Differentials.

Editor Cotton:

This letter is prompted by the discussion now going on in the "How Other Men Manage" Department on the subject of fly frame differentials.

As most mill men know, the front roll of a speeder rotates at a constant rate of speed, hence a uniform length of roving is being delivered constantly. With the bobbin it is different, as its speed of rotation is changed at the completion of every traverse. To do this suitable means must be employed for winding the roving on the bobbin and at the same time the action of the mechanism for the winding must be such that the roving will not be strained or broken. This is the very problem that confronted Mr. Green in the year 1823 when he was working to connect the spindle and bobbin together. It was soon discovered by Mr. Green and Mr. Holdsworth that in order to accomplish perfect winding, two mechanisms acting in combination were necessary; namely, the cones and the differential motion. Mr. Green first connected the spindles and the bobbin together in the year 1823, but owing to the shape of the cones at that time, and the lack of a differential motion, his years of hard work were a failure. Mr. Holdsworth was also at work, but instead of working

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on the combination of mechanisms invented at that time, he concentrated all his work on a mechanism that could be made up of two speeds, because he realized that if the winding arrangement had to be made up of two mechanisms acting in combination, one of the two had to be made up of two speeds. So after working for many years Mr. Holdsworth gave us the differential motion in the year 1826, which has never been improved excepting by a change which reduces the friction between the driving shaft and differential sleeve. This is accomplished by the use of a shell or bushing inserted between the sleeve and the shaft. This was done in 1897 by Fay Martin. This bushing or shell does not revolve but is fastened in such a way that the main shaft is free to revolve on the inside while the sleeve gear revolves free upon the outside, and these in opposite directions without touching each other.

When Mr. Holdsworth gave us his wonderful invention it was an incentive to other inventors, because more inventors have worked on the differential motion than on any other device, and many other improvements were discovered which were a great help to the combination of these two mechanisms.

One of these improvements was the introduction of the cones which have replaced the old unequal racks used previously for many years. As I have said, after many years of hard work and study it was found that if a bobbin increased in diameter from one inch to one and one eighth inches, the proportionate increase was one ninth of the total, but if the bobbin increased from three and seven-eighths inches to four inches, the proportionate increase was only one thirty-second part of the total diameter, so it was clearly realized that the equal increase of one-eighth of an inch in diameter of the bobbin was only equal in addition and was very unequal in proportion. To obtain the intermediate speeds the cones were considered as a continuous string of pulleys connected together, and in finding their true outline each layer added to the bobbin of roving was considered separately and the diameter of the cones figured for that layer alone and the result was a concave upper cone which gave the cones their peculiar formation, the most essential feature of the cotton roving frame.

It was only a comparatively few years ago that it was the common practice on all fly frames to have the flyer lead the bobbin and was known as the flyer-lead frame. It was soon found, however, that this system had two defects; (1) the bottom cone had its slowest speed when the bobbin was empty and its greatest speed when nearly full or filled, the bottom cone constantly and uniformly increasing in the number of revolutions per minute between these two extremes; (2) the flyer started in advance of the bobbin and by so doing made a weak place in the roving.

Regarding the first named defect, it will be seen that on the bobbin-lead the speed at the beginning and ending of the set are opposite to that of the flyer-lead; that is, by the speed of the bobbin being greater than that of the flyer. The bobbin rotates at its greatest speed when empty and at its lowest speed when full. It should be seen in such a case that as the bobbin grows larger in diameter and heavier, the bottom cone decreases in the number of revolutions at every completion of the traverse, thus making the consumption of power more uniform.

With reference to the other defect mentioned, which was very much misunderstood for many years: At that time the slipping of the cone belt was given as the reason of the weak places in the roving. Others claimed that owing to the flyer starting first and the velocities of the bobbin and spindles at the instant of starting not being in the required ratio, weak places were caused in the roving. If the actual number of gears connecting the bobbins and cones and the number of gears from the driving shaft to the spindle are considered, it will be found when using the Holdsworth differential motion that the actual number of gears in the train to the bobbin is nine and from the driving shaft to the spindle is five. From this it should be seen that the cause of the flyer starting before the bobbin is owing to the back lash which is more in nine gears than in the train of five gears, so, as stated, in order to remedy these two defects, the system was altered and the bobbin was made to lead.

Bab (N. C.)

## A Remedy for Uneven Laps.

EDITOR COTTON:

I am going to give the following suggestion to any of your readers who have trouble in making even laps in the picker room:

Cover the cones on the evener motion with leather about ½-inch wide, wound in the same manner as card clothing, starting at the small end, sandpaper it and give it a coat of shellac. This will eliminate all of the slip of the cone belts. Bear in mind that the cone belt, although only ¾ to 1 inch wide, has to drive the apron and feed rolls, and no belt works well on a bare iron cone.

Anyone who will try this will be surprised at the results. Lost motion causes over 50 per cent of all the uneven laps that are made. Another thing: we should never allow picker tenders to change two full laps at the same time; they should alternate, say 1, 3, 2, 4, then the evener motion will take care of the work.

The lap head friction should be scraped once a week.

R. S. (Ala.)

## Leaves Out Intermediate Pickers.

EDITOR COTTON:

I am way behind in participating in the discussion. Going back a little bit, I will reply to the letter of "K. (Ohio)," appearing in the September, 1921, number, in which he takes issue with me as to the advisability of removing the intermediate lapper machines for securing better work.

First I want to state that I was only making a production of 50,000 pounds a week, while "K." says he was making 90,000 pounds a week, and I had intermediate and jack roving frames and double roving in the spinning room. He says he had only four breakers, four intermediates and five finishers. That's just what I have. He ran his finisher beaters 1,500 r. p. m.; I ran mine 1,200 r. p. m., with a 10.50-ounce lap, 46-grain sliver, 50-grain finished drawing sliver, with the slubbers, intermediates and jack roving frames to draw it down to a 5.60 and 7.00 hank roving for the spinning room, for 30s and 40s yarn.

Of course there are a number of things that tend toward permitting this elimination of the intermediate picker, I have ball bearings on the aprons, patent swings for the evener belts which take up all the slack at all times, and make them run almost true and almost without slippage,

# EDWARD A. STUHRMAN

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I have ball bearings on the beaters, and a good first-class feeding of the hoppers on the breakers. My white waste is mixed as thoroughly as is possible for it to be mixed, and I don't have very much of it, either from the spinning or the card room. This is mixed by means of connecting the waste hopper with a pipe to feed behind the cotton condenser, and it flows as the cotton flows, and is cut down so as to flow regularly with the cotton throughout the day.

And on the cards I have a draft of only 95.97, or thereabouts, and good and regular grinding and settings. I have experimented with different settings and settled on the ones I now use with the two processes of pickers. I run a doffer speed of 11.50, and a front roll speed on the drawing of 290 r. p. m.

This reminds me of an old darkey I had working for me some time ago. He got put in jail and sent for me. I went up to see what he wanted and when I got there I asked him why he was in there. He said he was only walking down the street and was not moving fast enough for the traffic and the cops carried him in. I said, "Why, John, they shouldn't have put you in just for that. They have no case against you, and ought to turn you out." "Yessir," said John, "but I'se in here, and I wants to get out."

It may sound a little "off" about the intermediate picker being sidetracked in this particular case, but there's the facts, and has proven so, by prolonged tests. In fact, when I took hold of the job I tried to make the managers believe that the intermediates would make stronger yarn, so we tested it at length, and I could not make the three processes of picking show up stronger; and I gave it my personal attention, too, so there you are. It happened here, and is now running, with as strong breaking tests on the yarn as Mr. Anybody's, and if "K." will give me his breaking strength on the yarn he tested, I will in turn give mine just as the spinner sends it to the office every day, and will take any weekly report he suggests, at the same time, giving the number of the yarn and showing the variation of the yarn and its breaking tests. T. A. D. (Ga.)

## Combatting the Slug and the Bunch.

Editor Cotton:

A spooling machine is used to perform the two rather different functions of increasing production and improving quality. Primarily, it transfers yarn from a bobbin to a larger package, secondly it removes a certain number of slugs and bunches that have been made during the preceding processes. The first function is a necessary one under the present organization of cotton mills; the second is an unavoidable evil, the usefulness of which is directly proportional to the number of slugs and bunches injected in the work at an earlier stage. Whereas it may never be practical to eliminate entirely the slug catcher from the spooler, is it not worth while to turn our attention for a moment to the source of trouble rather than to its remedy?

No slug catcher has yet been devised which will take out all of the imperfections; none has been made so well that the piece-worker cannot tamper with it; and none has been discovered but that will get out of adjustment and demand attention from section hands and overseers. The spooled yarn does, in consequence, contain soft, unremovable slugs or larger, hard ones that have passed through widened slug catchers. The arrangement is an imperfect one at best.

What can be done? In the first place, the spooler should be considered as an indicator of the care that is being taken in the earlier processes. By examining the waste pieces broken at the slug catcher, one can, in some measure, determine where the bad work is being made. Once these centers of iniquity have been discovered, a remedy can be devised.

Working along the line that it is far more economical in the end to attack the bad work before it is made than after it is in yarn, we made a number of rather interesting discoveries at our mill.

Starting at the cards, we found that the card tenders were using large hand mops for cleaning. As a card tender swings one of these with more or less abandon, a large amount of fly drops into the web and folds into the sliver. We eliminated the mops. Card tenders now clean with hand brushes. The cards are just as clean and the added labor is slight.

At the drawing frames we prohibited all snapping of ends at the back. Of all practices in the card room, this is perhaps the most atrocious. Light work is only one bad result, as described by a contributor in the February number of Cotton. Bunches caused by folded ends will cause waste and broken ends at each succeeding process. We also cautioned the drawing tenders to wipe underclearers and surface fly after each doff.

The oiling schedule here had been thorough and systematic, but there had been little or no provision for scouring. We started an orderly plan for cleaning each frame at regular and frequent intervals. The scouring brought out at least two defects: Just above the drawing frames were some large unguarded driving belts which furnished power to several lines of cards. These belts were dressed at intervals after which the dressing would cake and fall onto the drawing. The slivers then carried these cakes up into the flutes of the drawing rolls. As the diameter of the roll was thus changed, its drawing capacity at that particular point was lessened. Bunchy sliver was the result. We ordered belt guards at once.

We also found that some top rolls were not running freely. These were either frozen or needed to be re-neckel, The fault was quickly remedied at the machine shop.

One of the interesting sidelights in connection with our changes at the drawing frames was the fact that our slubber tenders were immediately able to turn out the same production requirements in one hour less time each day.

The roving frame, while a most ingenious machine, is also a most imperfect one. A broken end is bound to slash and a slashing end means bunches. Here it is that bunches injected earlier begin to multiply through the medium of the resultant broken and slashing ends. A certain amount of fly collects on the flyers. At times, due to starting and stopping, air currents are set up, which cause this surface fly to let go. The air carries it into the roving and there is another bunch to cause trouble and bad yarn. There is no such thing as a self-cleaning flyer, nor any other machine to do the work of a fly frame, so the job of keeping those flyers clean was left to the speeder tender. Flyers had been previously wiped at each doff. We added one, or in some cases, two, wipings during each set. A similar procedure was applied to the top clearers.

At the spinning we eliminated many of the bunches by

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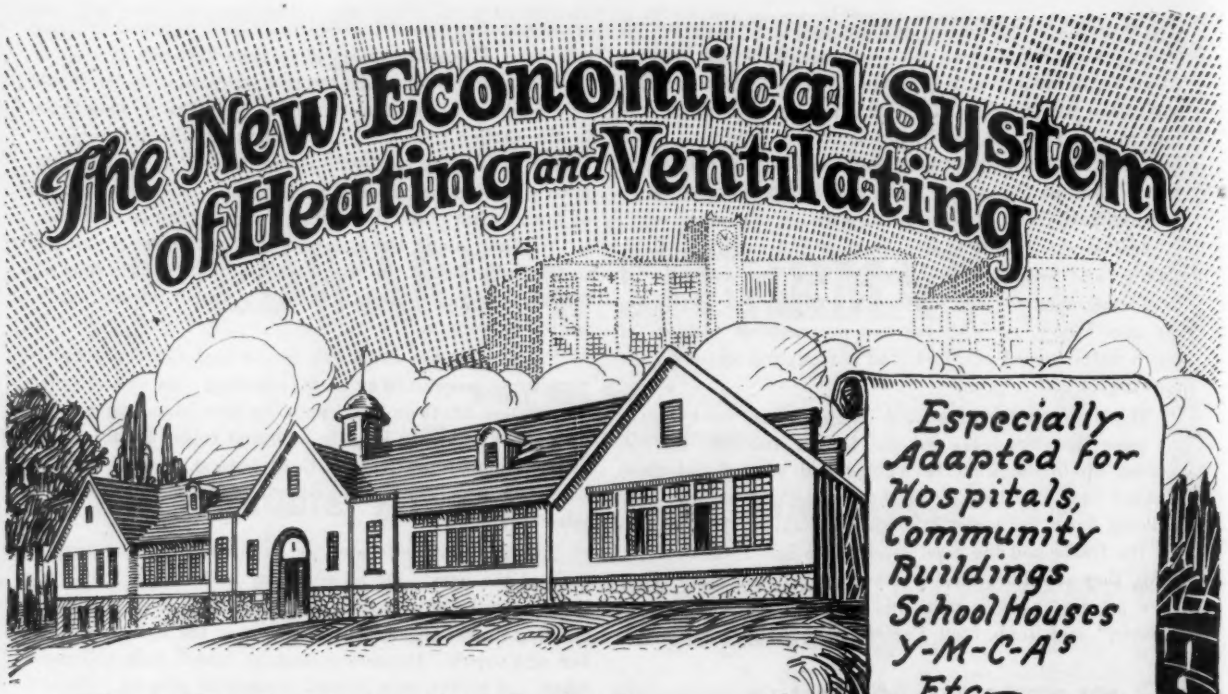

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The new "Heatovent" System not only cuts heating and ventilation costs to the minimum, but it insures correct temperature with fresh, warm air. It's the "push-button" system whereby a room is individually heated and ventilated only when it is occupied—the same principle as your lighting system—you wouldn't waste current by having the entire building lighted up when only one room was being used.

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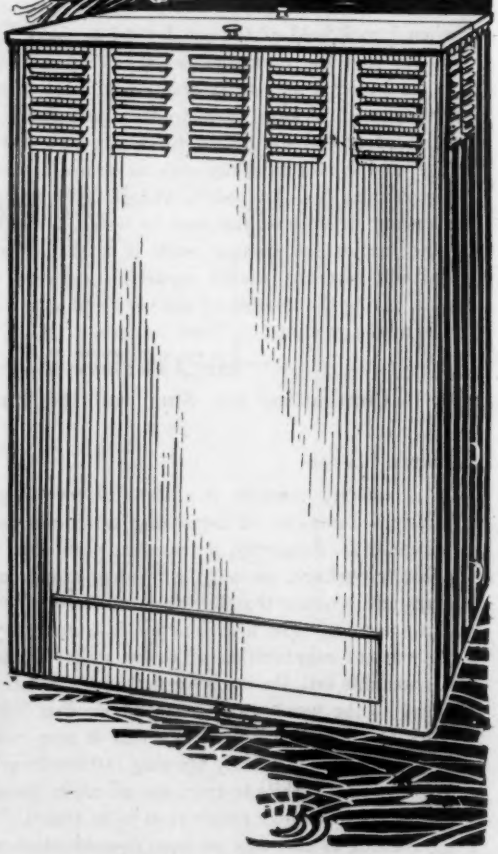

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having all cleaning of roller beams, thread guides and ring rails done with the frame stopped.

Our greatest problem, however, was the one of brushing down. Those ultra-modern mills which have no overhead shafting or belts may not be affected by fly collecting on the ceiling and pipes. Fine goods mills do not have the degree of trouble as do mills running medium or coarse counts. But most mills and particularly those running yarns up to 40s must expect this overhead fly menace. Modern humidifying systems have been an aid to the mill man in this connection, but they have not been a cure.

We, however, had overhead shafts, belts, pulleys, pipes, and whatnot. The humidifying system was not automatic. The stuff hung up there on this conglomeration and we had to get it down without injecting it into the work. As long as it hung there it did no harm, so we eliminated all brushing down operations but one on Friday. We experimented with mops, brooms, and hose on poles, choosing each for some particular use. We inverted all empty cans in the room. The brushing-down squad went ahead; the clean-up squad followed. At the cards, the fly was brushed from walls and ceilings first, then the cards thoroughly cleaned, then inspected before starting them again.

At the drawing and fly frames, we used heavy, cloth-backed paper for covering up. The same general system of cleaning and inspection was carried on here. Doffers were used as the clean-up squad at the fly frames. By dividing the work among them, the cleaning of backs, fronts, and flyers was quickly accomplished.

Brushing down in the spinning room was simpler, but we exercised great care.

Now to return to our spooler. The greater ease with which the spooling department got out its production requirements was at once noticeable. Reports from the cloth inspection department soon become most encouraging. We felt that we were on the right track.

This brushing down system has persisted for quite some time now. It is necessary to have a special drive on slugs and bunches at intervals, but on the whole the plan has been most satisfactory.

What are others doing to combat the evil of the "slug and the bunch?" Bill (Mass.)

## Compression Obtained With a Screw Press.

Editor Cotton:

I should like to get a rule to figure out the total tonnage of a screw press, and the tonnage per square inch. I have a screw press made by Boomer & Boschert Press Co., Syracuse, N. Y., —F-7—and would like to obtain the above information.

Rock (Mass.)

Editor Cotton:

Replying to "Rock's" inquiry regarding the compression in pounds or tons that may be obtained with a screw press, I wish to suggest that it is not practicable, because of friction losses, to calculate such results. Friction in these machines is a very uncertain factor as it depends upon, and varies with, the load or pressure on the working or wearing surfaces; the condition of these surfaces as regards smoothness, and the kind and quality of lubricant used.

To estimate the theoretical compressive force of presses is a comparatively simple matter, the accuracy of such results depending principally on the accuracy with which certain measurements are made. There are two types or kinds of presses on the market, these being represented diagramatically in Figs. 1 and 2. To find the pressure exerted by the style shown in Fig. 1, multiply the pull at $P$ in pounds by the circumference of the circle $C$ in inches, and divide the product by the pitch of the screw-thread $S$ in inches; the quotient will represent the total thrust or

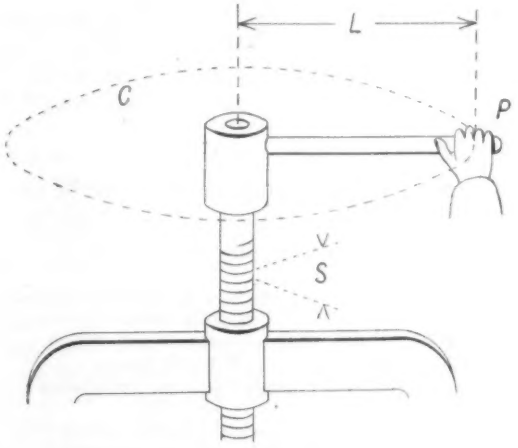


Fig. 1.

pressure exerted by the screw, in pounds. The number of pounds divided by 2,000 will give the number of tons pressure. The pressure per square inch of the platen, or per square inch of that part of the platen which is covered by the goods, is found by dividing the pressure in pounds, or in tons, by such covered area of platen in square inches.

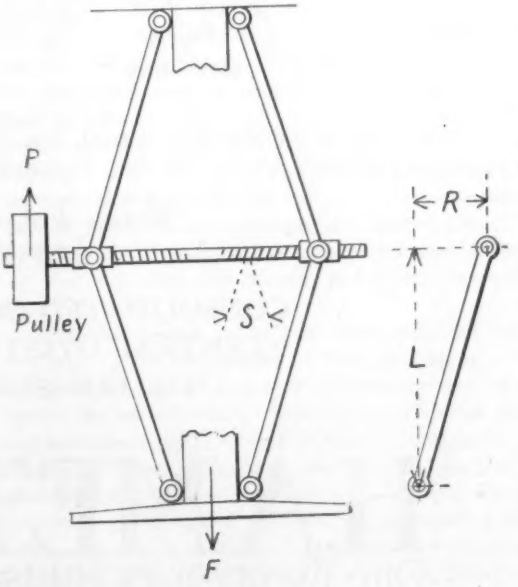


Fig. 2.

The pull at $P$ can only be obtained by applying a spring balance or scales and noting the indications of the pointer. Finding the force tending to turn the screw is the most difficult part of the undertaking in both Fig. 1 and Fig. 2.

The same result as that obtained with the foregoing rule is given by the following rules:

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$$\text{Pounds} = \frac{6.28 \times \text{length of lever } L \times \text{pull at } P}{\text{pitch of screw-thread}}$$

$$\text{Tons} = \frac{\text{length of lever } L \times \text{pull at } P}{318 \times \text{pitch of screw-thread}}$$

Measurements are in inches, and the pull, in pounds. If the friction losses are assumed to be 10 per cent, the pressure in pounds, or tons, will of course be 90 per cent of that found with the rules.

In Fig. 2 the force exerted in the direction $F$ is found by means of the rules:

$$\text{Lbs} = \frac{1.57 \times \text{diam. pulley in ins.} \times \text{pull at } P \times \text{length } L \text{ of lever}}{\text{pitch of screw } S \text{ in inches} \times \text{distance } R \text{ in inches}}$$

$$\text{Tons} = \frac{\text{Diam. pulley in inches} \times \text{pull at } P \times \text{length } L \text{ or lever}}{1272 \times \text{pitch of screw } S \text{ in inches} \times \text{distance } R \text{ in inches}}$$

It will no doubt be noticed that the length of the toggle lever measured in the direction of $L$, Fig. 2, changes with every turn of the screw, as does the distance $R$ also. For this reason the pressure calculated with one set of measurements will not hold good for any other set of measurements. And it will be found that the pressure increases very rapidly as the toggle levers approach a vertical position and assume a straight line, or nearly so. The friction loss in Fig. 2 will be a little greater than in Fig. 1.

Millwright (N. C.)

## An Experience and An Opinion.

Editor Cotton:

I have just been reading Cotton and it brought back memories of the old times. When I started to work in the mill I was young, but I sure do remember those days when the boss would come around and take the boys by the ear and swear at them. I was a doffer in the spinning room, and every chance I would get I would go around and watch the section hand fix the frames. One day I thought to myself, "Will I ever be able to fix them like him?" I kept on watching him and looking at the machines run, and finally this came to me, "If another man has the brains to make that frame, I have got enough brains to fix it," so I asked the section hand to let me try to fix some of the frames, and he did. Then I asked the overseer if he would give me a trial on a section, and he said, "Yes, I have been watching you for some time, and if you try as hard on a section as you have tried on other jobs, you'll make good." I did. I was working all the time experimenting on ends and builders to see how goodlooking a bobbin I could make.

About this time they started the No. 2 Mill, with H. & B. frames, and one day they wanted to change from warp to filling and the overseer couldn't get it to work. So he came over and asked my overseer if he knew anything about that make of frames. "No," was the reply, "but I have a boy that is running a section for me; I think he can fix it up for you if you let him." After a while he called me and said, "Jack, do you know anything about the frames in the No. 2 Mill?" "No sir," I replied. "but I am willing to learn." "Well, you go over to the overseer, he wants you to see what is the matter with the frames they put on filling."

Well, I went over with one hand in my pocket and my heart in my throat for I was afraid I wouldn't be able to fix it. I walked up to the overseer and said, "Yes, sir, I'm here. I don't know the trouble but if you will show me that frame maybe I can find out." We went over to where it was. "Why won't that rail go up to the top?" he asked. You have seen a dog when it was lost; that's the way I felt. But I looked it over and the first thing I noticed was that where the rod that works on the stroke stand was not moved as it should have been, and I told the overseer. "No," he said, "that's all right."

So there I was. I knew that it was wrong and I waited until he went away and then moved it as I thought it ought to be, and as luck would have it, it worked fine. I braced myself up and strutted back to my overseer to tell him just what happened. "Thank you, Jack, I knew that you would find it. Keep right on the job." That made me work harder than ever, but here is where I had bad luck. My overseer was taken sick and died, and then everything began going hard with me. They got a new overseer who didn't like me much for some reason or another, and since that time I learned that a man could not make good unless he had someone to pull or push him along.

While I was reading the discussions this all came to me for everyone of us thinks his opinion is right, but I will differ from that, as I believe that there is not one man that knows it all. What will work in one mill and work fine will not work in another mill under the same conditions. I know this by experience. Here is one instance: I saw in a certain mill running 1⅛-inch Texas cotton with a draft of 14 inches, the spinners were running from 10 to 14 sides with 256 spindles per frame. I went to work in another mill that had the same make of machinery, with the same stock, and we couldn't get good spinning with a draft of over 10 inches, the setting was the same from the breaker picker to the spinning frame, and the humidity was the same. Any man who travels around and takes any interest in mill work will find out more than a man who stays at home. I have worked from feeding the old-time picker by hand, through the card room. spinning, and weaving, and also other departments, and I learn more everywhere I go.

There has been a lot of talk about mills not running regularly. Have you stopped to think what is the cause of this trouble? It is caused by the management of some part of the manufacturing. Sometimes the biggest cause is that the men do not know how to train the men under them. I know, and you know that a lot of mills have men who never swept, doffed or spun, or run a section. Probably they were on oiling and a section. You cannot make me believe that a man can run a job without coming from the bottom and getting the experience of work. Then he can teach other help how to run a job and run it right. I have seen men who have worked in the mill for years yet they didn't amount to but just a little more at the end than they did at the beginning, and yet they got a good job. Why? Because the boss liked them. But can that man produce as good quality as any other man that is intelligent? Shall we place a man in a position of that kind

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Glauber's Salt
Formic Acid 90%
Formaldehyde
Bichromate of Potash
Carbonate of Potash
Caustic Potash
Permanganate of Potash
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Sodium Sulphide—60% Conc. (Broken Pieces)
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**Any man or house can maintain high levels of chemical quality for a short period. But the trained skepticism of chemical buyers will award no prizes for brief success.**

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# The ROESSLER & HASSLACHER CHEMICAL CO.
## 709 Sixth Ave., New York

because he is a good fellow, or because he is qualified for the place? We all have our faults, but let us overcome these faults as much as possible. J. M. D. (Pa.)

## Some Observations on Efficiency.

Editor Cotton:

Yes, as "Wash" says in the January number, the longer we live the more convinced we become that there is a proper and an improper way, an extravagant and a parsimonious way, to accomplish things, and especially is this true in a card room, which, I presume after reading his letter on "The Duties of the Efficiency Man" in January Cotton, is "Wash's" strong point. True, there is "wisdom in a multitude of councilors"—this is not a one-man possibility—but why soft-pedal this efficiency man? In this age of keen competition and demands for variety and quality, the person of "drifting thoughts" and "uncertain mind" stands no more show than a pegleg man at a kicking frolic.

The man in charge should be cocksure, and then select overseers for each department who know the various processes, who have the skill and practical experience to master the situation, and if the superintendent finds his man is not delivering the goods, yet is doing the best he can, he should inform him that his best is too small and let the axe fall.

I realize that good carders are few and far between, but even those possessed of ability as good as the best would not and should not stand for this efficiency man (be he president, manager or superintendent) for he certainly would be intruding on the right of the overseer of this department who, of all concerned, has or should have his finger on the pulse of the whole situation from the office to the finished product under his care. His watchword is efficient eternal vigilance, for with him it is never out and never over, but going on all the time.

Every student has concluded that there are but two kinds of nature—human and animal. As there is but one nature for us, we cannot acquire another, and between nature and disposition there is continually going on a dual operation; especially is this true of the better element of humanity. If there are 500 employees in his department, the overseer has that number of dispositions to study, as we rarely find two of the same make-up. Hence there is not and never can be any set or fixed rule of law other than that of the ability of a leader to cope with the situation of conditions.

It is true that efficiency experts have attained success in different trades and commercial professions, but an efficient textile man will (if capable to the point of just what the word efficiency implies) agree that there is no calling on earth so nearly approaching individualism as textiles. There are some men, officials, superintendents and overseers, who think they are the whole works of the industry, when in reality they are just parts of a small unit that forms the link in a chain. Whether this chain is weak or powerful depends largely on the respective heads of the various departments, and justly so, for they are responsible for the amount of cooperation and knowledge they are able to instill and extract from everyone within their supervision. A competent overseer knows this, and puts forth his best efforts in acquiring good and useful training to equip him as the only efficient referee for his department, scientifically and practically.

I do not agree with "Wash," in the eighth paragraph of his letter, that in almost every mill we find a very good carder or spinner, whose ability is measured by his being able to find the proper draft and insert the proper twist and also to properly manage the help. While these are necessary assets, they do not constitute the whole. A competent carder would not consider an applicant to put up roving around intermediates and speeders if he was very short and stout, but would advise him of a more suitable place. The long, lean fellow who asks for a set of cards would not be located there if he needed a roving man. The number of movements required on the part of an operative to do a thing in the right way is one of his qualities to observe and improve, as occasion demands, especially watching the results obtained, as there are exceptions in almost every case.

Many carders of my personal acquaintance are experts as operatives at every process in the department of which they have charge, but have grown a little stale from inactivity. When a carder has trained other reliable sources and placed in charge these understudies for training operatives, he will not tolerate any waste of energy and unnecessary actions in the room. He even tries to instruct the poor fellow he knows is a hopeless case, and whom he is forced to discard eventually as an impossibility. Just as the good physician knows the symptoms of undeveloped cases and the remedy to apply, so also the good carder knows his workers almost from the start. Then why call all carders good ones or confuse this efficiency man with him when the very qualities summed up are essential to a good carder?

Far be it from me to eulogize myself, for I am just relating experiences. Nine of my thirty-one years in the textile field have been spent as a fitter and erector with two of the more prominent machine builders of America, working from Maine to Texas, and I have come in contact with some of the best, the so-so and the poorest, from sweeper to superintendent, and from office janitor to president, and I have been asked some very difficult as well as some very silly and simple questions by men of all calibers, and even criticized if I was without a ready answer and remedy for all things upon which I was approached.

Just now I recall an instance of a superintendent who was engaged on a big job, and who had leased a small yarn mill on the side. After experimenting with three different superintendents in as many years, with little or no success, he decided to train up his eldest son, a boy of 23 years. After working him through the mill of which he was in charge, he sent the boy to a school to finish up. On returning home, after completing his studies, the young man was placed at this yarn mill to dismiss and succeed the superintendent then in charge. With pencil and tablet in hand, he started in at the picker room, checking up, to find the money-leaks. After okehing down to the drawing frames, he stopped in great astonishment and called the tender to close down his frames at once and go get the overseer for him. Imagine the bewilderment of the overseer when the young man said he had located the trouble with his father's mill and the past management. When the overseer asked to be shown, the young man replied, "Why, can't you see? There are six ends going in and only one coming out!"

That boy today is an efficiency man, or as "Wash" says,

QUALITY

# But THIS Is Not "Bull"

Some advertisements which you read may contain a little "bull," but this one does not. And it's not "bull" when users of Bondaron Textile Leathers make statements like the following:

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These are only two of the many records of satisfaction and long life experienced by users of

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*Its Full of Accurate Production Cost Facts*

It explains the most accurate and most economical way to get an infallible record of each inch or yard of goods you produce—even shows you how each pick can be counted.

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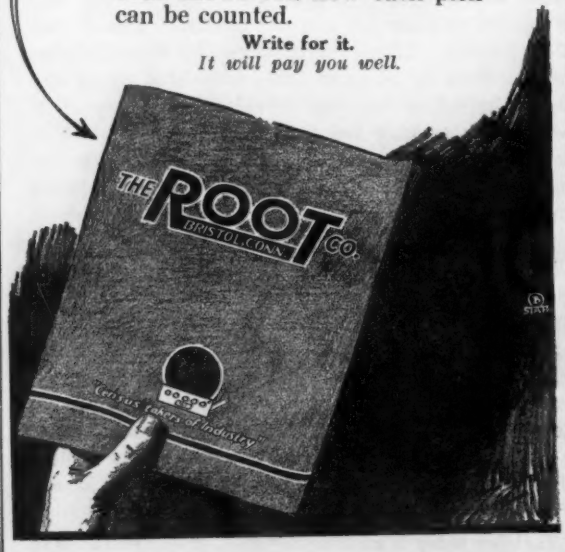
*It will pay you well.*



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***Warren Soap Warren Service***

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"what-ever-you-may-call-them." However, he is getting paid to superintend a mill.

With regard to the trumpet holes for sliver, would it not be better to adapt the sliver hole to suit the weight and condensation desired, and use a tapered circular gauge for each and have them uniform? Then when the careless operative "Wash" pictures at this process attempts to make the piecing described, the lump has been caught at the sliver trumpet and he soon realizes he is only making work for his own hands. I don't think it is a good policy to have back and front tenders on drawing, as is the practice in some mills, and to those who contemplate trying to adjust the doffer comb blades all to one position, I would say go on with the experiment as "Wash" points out, and when disgusted (as will be the case in some instances) get over the trouble by positioning each comb blade to its own peculiar conditions. After the setting has been made and the card started, see that the selvages do not tear, or crack, as this may take place and not cause the end to come down for several hours, and is evidence that the comb is too high. The other extreme is a wavy or wrinkled web, also the noticeable escaping or leaking over of the stock, when neither of the foregoing things happen. Then stop the card and just when the comb blade is at its lowest or downward point, see that the web and blade are 1/16 to 1/8 of an inch apart, and I'll guarantee that there won't be any trouble in locating the comb blade, though the position is changed often from January to December.

"Wash" asks concerning his efficiency man, "How often is such a man found in cotton manufacturing industry?" In this country of specialization, I don't recall a single one. Frankly, I do not believe his article in the January issue is "Wash's" honest convictions, but rather an ingenious idea that has stolen into his mind for bringing down the wrath upon his head he so justly deserves in this case. Let's ask him to get away from this antique stuff and let us have some of his honest-to-goodness progressive causes and results.

I recently had a young man apply for a place as section man in spinning. On questioning him as to what he could do, I was much impressed when told he could do every little thing about the job. This reply got him the place, for my sweepers can detect a shaft falling down, or a machine on fire.

Heretofore, when overseers were past the age of usefulness, they were retired on a quill cleaning or sweeping job. Now that modern machinery is doing this work my future is not very clear to me. Maybe the advent of this efficiency man will open up some avenue of consolation; one can never tell. Just a few years ago New England told us we could never spin fine yarns in the South. Today North Carolina is successfully spinning 100s, and hopes eventually to spin even finer yarns. I knew a fellow working on a five-roller process, eight into one delivery drawing frame to eliminate one more process. Will it make good?

Competition (N. C.)

---

Elbert Hubbard was once asked by an aspiring young man if he would give him a formula for making friends. The answer of Fra Elbertus, significantly characteristic and brief, was , "Be One."

## Setting Mote Knives.

Editor Cotton:

"W. H. J. (Mass.)," in the February number, asks concerning mote knives, what angle they should be set to, how many there should be, and how close they should be set to the licker-in.

In several contributions to this department I have pointed out that the mote knives are of little value as a cleaning agent. First, let us consider what takes place in the field of action between the feed plate and the licker-in screen. The licker-in teeth play through the hanging fringe, the spiral action of the licker-in fillet causes the stock to enter the grooves. Therefore, the mote knives do not act on the stock.

In the second place all impurities must leave the surface of the licker-in to be struck by the mote knives, therefore all impurities leaving the surface of the licker-in fall to the floor without any aid from the mote knives.

There is no doubt in my mind that many readers of this department will not agree with me on this point, but I have always given proof of all my statements, and to prove my argument in this case, let the reader make several laps from the same bale. Next, set the mote knives to an 8/1000 gauge, run two or three laps and weigh the droppings. Then remove one knife and run the same number of laps through, and again weigh the droppings. It will be found in the majority of such tests that the best results will be secured with one mote knife. Next, pack the back of the card as close as possible, have all doors fitted tight, and set the feed plate to the licker-in almost to touch. See that the packing under the card is air tight. Run the same number of laps and again weigh the droppings, and "you'll be surprised."

That the foreign matter must leave the surface of the licker-in in order to come in contact with the mote knives must be admitted, so on this point let us have no argument. Then why set the mote knives at different angles? It's all imagination. The chief point is to destroy as much as possible the air current that always exists around the surface of the licker-in.

However, mote knives are as useful to a card as the spooler guide is to a spooler. Set the mote knives to an 8/1000 gauge, and any large tuft of cotton or material of a hard nature will stop at the licker-in and save the wire on the card. When the mote knives are set to a 17/1000, the large tufts are allowed to reach the licker-in screen and the cotton jams the licker-in screen in all shapes.

This happens when a lap is allowed to run out, or when the stripper is careless when putting in a new lap.

Of course the mote knives are injured at times, but a good method is to have at least two sets on hand, so that if they are injured in any way, they can be sent to the builder for repairs, without interfering with the running of the room.

Wash (R. I.)

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Editor Cotton:

Although a recent subscriber to Cotton, I am very much interested in the discussion under the heading "How Other Men Manage."

"W. H. J. (Mass.)" in the February number asks for information concerning mote knives and how they should be set. The mote knives are made of iron, three inches wide,

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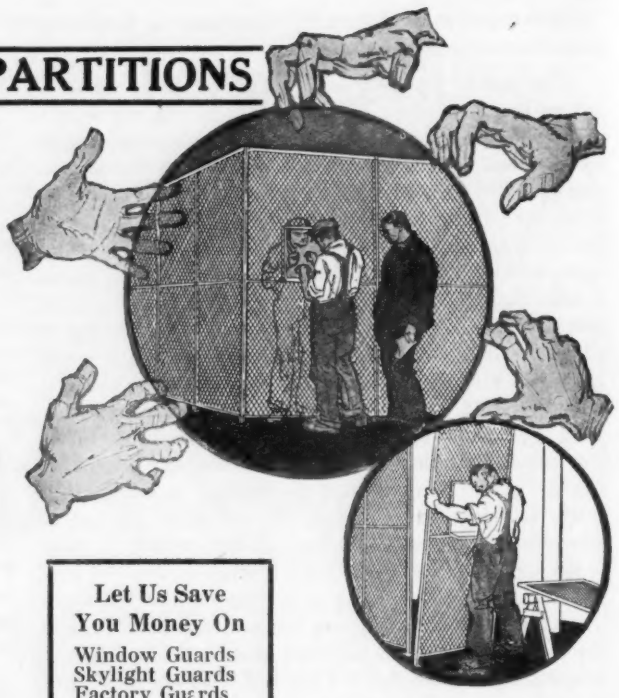

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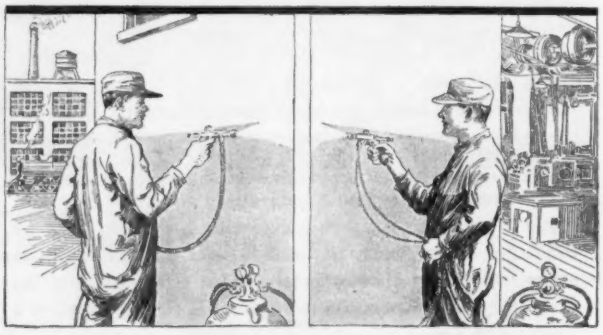

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one-half inch in thickness, and as long as the card is wide. One edge of the mote knives will be found to be beveled. This is done to insure a proper surface being presented to the fibers. The top mote knife is set with a 12/1000 gauge, and the bottom mote knife is set with a 15/1000 gauge.

Notlaw (N. C.)

## Settings for Whitin Model C and Model D-2 Combers.

EDITOR COTTON:

Replying to "Bab's" request in the December issue for some information on combers:

Combing of cotton removes the short fibers, neps, and other impurities left from the carding process, and gives to the yarn greater strength and more luster. I can take staple from 1 to 1 5/8 inches and, with a low percentage of waste, produce yarn that will be as strong as carded yarn made from cotton of 1/8 to 1/8-inch longer staple.

I will give in this letter the settings for the Whitin Model C and Model D-2 combers.

After a comber has been taken down to the upright stands and all parts cleaned, it should be assembled in the following order: Cam shaft, nipper shaft, top comb shaft, cylinder shaft, calender roll shaft, notched wheel shaft; then put the pawl arms in place with the cam rolls on them. Put the steel detaching roll in place, and see that the caps are tight. Have the outside cam roll in the heel of the cam, index pointer on 5, and put the driving shaft in place.

With the comber on 5, set the front edge of the segment 1⅛ inches from the back side of the detaching roll. Use the 1⅛-inch finger gauge for this setting. Turn the driving shaft and see at what time the detaching roll is moved forward by the outside cam. If it is not correct (it should be 6 for the Model C and 5¾ for the Model D-2), loosen the bolts in the cam and move it in the necessary direction to obtain the desired results. Bolt all up securely and turn around once and set the inside cam to correspond.

The Model D-2 comber has two bolts in the 80-tooth gear and a slot to work in so as to get the required results and not take it out of mesh.

Next put on the needle half laps and cylinder tins. Put leather detaching rolls in place. See that the flat side of the bushings on the ends of the rolls bear against the slides. Attach the roll weight to the stirrups and hang the stirrups in the bearing made for them in the bushing. Turn the comber until the segment comes under the leather detaching roll, index about 8. Set so that No. 25 gauge will go between the flat side of the bushing and the adjusting slides. Set the feed roll, according to the information to be given later. Put in the circular brushes and see that the bristles just touch the face of the brass needle bars.

Put in the nipper frames and set from the detaching roll to the cushion plate, and between the nipper knife and needle half laps, according to the staple being run, as shown in the setting list given later. Then put in the connecting rods, comber to be on index 14¼, nipper cam in high part, tighten nuts so as to hold paper. Put the comber on 10½ and put the nipper cams so as to hold paper. Put in the top combs and set according to the following setting information. Then the brass rolls, sliver pans and brass guides.

The following information is given as a guide for the settings mentioned. On the Model C comber, set the front of segment from detaching roll with finger gauge 1⅛-inch. The feed roll is to be set from the detaching roll according to the staple, as follows: ⅞ to 1⅛-inch staple, finger gauge 1 1/16; 1 3/16 to 1 5/16-inch staple, finger gauge 1¾; 1⅜ to 1⅝-inch staple, finger gauge 1⅞ to 1 15/16-inch.

Set angle on nipper knife 36 degrees, quadrant. The cushion plate is to be set from the detaching roll according to staple as follows: ⅞ to 1⅛-inch staple, finger gauge 1 7/16-inch; 1 3/16 to 1 5/16-inch staple, finger gauge 1⅜-inch; 1⅜ to 1⅝-inch staple, finger gauge 1 7/16-inch.

Set nipper knife from half lap, index 14¼, angle gauge 20. Top comb angle 30 degrees, quadrant. Top comb from segment, index 8, angle gauge 21. Brass roll from leather detaching roll, angle gauge 18.

For timing Model C comber, detaching roll should move forward at 6. Feed roll at 4 to 5¾. Nippers close at 10½.

On the Model D-2 comber, set the front of the segment from the detaching roll with finger gauge 1⅛-inch. Feed roll is set from the detaching roll according to staple, as follows: ⅞ to 1 3/16-inch staple, finger gauge 1⅝ to 1 15/16-inch; 1⅜ to 1⅝-inch staple, finger gauge 1¾-inches.

Set angle on nipper knife at 37 degrees, quadrant. Cushion plate to be set from detaching roll according to staple as follows: ⅞ to 1 3/16-inch staple, finger gauge 1 7/16-inch; 1⅜ to 1⅝-inch staple, finger gauge 1½-inches.

Set nipper knife from half lap, index 14¼, angle gauge 21. Top comb angle, old style 30 degrees, new style 19 degrees, quadrant. Top comb from segment, index 8, old style, angle gauge 18, new style, angle gauge 16. Brass roll from leather detaching roll, angle gauge 18.

For timing Model D-2 comber, detaching roll should move forward at 5¾. Feed roll at 6½ to 8. Nippers close at 10½.

I trust this will be of help to "Bab" and others interested in combing.

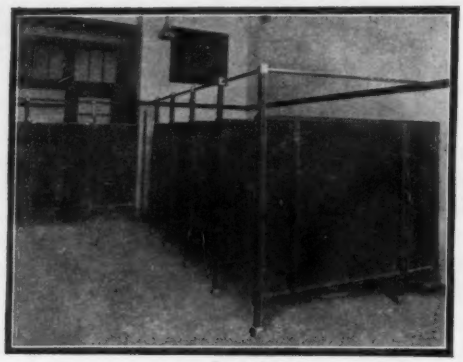
Q. E. D. (S. C.)

## "Wash" Makes a Promise.

In the November issue of COTTON I notice that H. D. Martin states in the fifth paragraph of his letter entitled "Good Carding:" "The secret of good running work and of making perfect yarns and woven goods is to have the best of carding."

This is the first time in all my mill career that I have seen the claim that good carding would make perfect yarns. H. D. made an awful slip of the pen—which is something new for him. However, did I not state not so long ago that a man was never wholly right nor wholly wrong? With the exception of the statement just quoted, I agree with every point in Mr. Martin's letter. Faulty mixing is an evil that is increasing in our mills, and in the most up-to-date mills at that, too. On the other hand, where the cotton is properly blended, oftentimes the whole thing is spoiled by allowing the drawing tenders to put up all full cans together at the back. The mill man must do one of two things: Stop this, or have spring bottoms in all the cans.

Then, why claim that a perfect yarn or cloth can be made when the fly-frame is imperfect and stretches the work during winding? I want to repeat here that when a man stops any fly-frame and lifts any bobbin gear and turns it back, to create a little slack, and then starts the frame, he can watch the slack disappear in less than 15 seconds. This



*Installation*

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proves that stretch takes place on all ends during winding, and that a draft exists from the drawing rolls to the surface of the bobbin.

Now, how can perfect roving or yarn be made with this condition staring us in the face? I hope Mr. Martin will answer. I hope many others will answer. It is the most vital evil in our cotton mills. You never even see this discussed in the different meetings held by mill men, North or South. They will instead explain about mixing and letting it stand for so long, etc., things that our grandfathers knew. What's the use of having things perfect in the preceding processes when you spoil them in the succeeding processes? You read some articles that would give you the idea that an even lap (which is not possible with our present picking system) and a certain draft and settings, will make even roving and yarn. Allowing drawing tenders to put up all full cans at the back is one of the worst evils for the production of uneven yarn. How many mills do you find with spring bottoms in the roving cans?

Here is another thing: A man sizes his yarn and gets a sizing something like this: 29.85, 28.01, 27.40, 31.06. This is supposed to be 28s yarn. Then figure the variation that must take place to create such a difference. Take the two extremes—27.40 and 31.06—and figure back to the finished drawing sliver, and it will be found that no such variation takes place in the finished drawing sliver. The light yarn is caused by stretch on the fly frame. These are the evils that should be discussed by our operating executives in their meetings.

Cotton is read around the world, and I will, if you will allow, write an article with a sketch of a new device (patent now pending) that removes all strain from the cone belt, and holds conditions equal on all fly frames. I know it will be welcomed by mill men. It is truly a cone-driven frame.

But what's the use of new inventions in carding? Look up the article written by "Tom (Mass.)" in the June issue of Cotton. He says, "All I ask is that every one of the skeptical, short draft boys very carefully and quietly prepare an even lap, 18 ounces, and change his draft to say 158 inches (no more; no less) compare the two slivers very carefully, then put that sliver into the sliver lap or ribbon lap machines and then through the combers, examine them, match the long draft sliver with the one from the short draft cards, and then get busy and have some small draft gears made for his cards and enjoy good sizing, clean yarn, strong yarn, and happiness."

Never mind the settings of the flats and doffer; they don't amount to anything. If what he states is true, then he has made a most wonderful discovery.

But in the November issue we find a letter on "Even Work on Pickers and Cards," written by "K. S. (N. C.)" which is very instructive and practical. "K. S." is like "Wash"—he is afraid to admit the truth. I agree with every statement. Following is the proof that "K. S." is dead right.

If the same amount of stock passing under the plates or evener motion does not vary, the evener belt will not change its position on the cones. There must be a gain or loss in the amount of stock to cause a change in the position of the cone belt. Therefore, if a heavier place, the faulty part continues until the cone belt is shifted to equal the amount and the same thing takes place when a light portion comes under the action of the plates. In other words, most of the faulty work passes before the action of the evener, and the part it is supposed to correct escapes. Are these not facts? An even lap is an impossibility with our present system of picking.

"K. S." is dead right, not only in pointing out that it is impossible to even a sheet of lap, inch by inch, but that there is great room for improvement.

Wash (R: I.)

## Ring Travelers.

Editor Cotton:

Should ring travelers be renewed? If so, how often should they be changed?

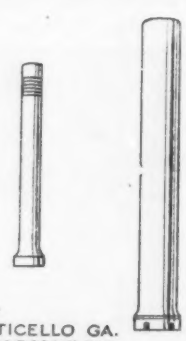
It is a generally conceded fact that all ring travelers give their best service when new, but it is also well known that the problem of keeping them new has not been solved. Just as soon as they are started they begin to wear. They are the hardest worked piece of metal in the process of spinning or twisting, and on fine work the traveler often races around the ring at the rate of a mile a minute. No oil, as a rule, can be applied to the race course, and the traveler must slide along on a dead surface; there are no wheels or ball bearings to make its journey comfortable. This tough journey soon causes the burnished edge of the traveler to wear off, thus increasing the wearing surface of the traveler against the ring, which overheats the metal and causes the traveler to drag. This results in an increased tension or drag on the yarn, causing many breakages which cannot be prevented without renewing the travelers.

Thus, at its best, the ring traveler does not last any too long, and the length of its life is also governed by such things as the size of the rings, length of traverse, amount of twist in the yarn, speed of spindles, and also the style and kind of travelers.

On coarse, heavy work, it is found necessary to change travelers more often than on medium counts. On very fine work they practically "change themselves" because they wear out so often and fly off the rings, making it necessary for them to be replaced. While the speed of the traveler on the coarser work may be perhaps one-half as much as on the fine work, the weight and load may be many times more.

While no set rules can be laid down here that would apply specifically to every mill, still the following recommendations will be found to be very helpful under ordinary conditions. On medium counts, say 30s to 60s, the travelers should be renewed at least once a month. On coarser counts, once in three weeks, or twice a month will give even better results. For the finer numbers, say above 60s, it will be found, as indicated, that these fly off very frequently.

The matter of renewing ring travelers is a very important one which should be given constant attention. There often comes a loss in production through negligence in replacing travelers, while on the other hand, a regular system of renewing the travelers, such as the one outlined in the preceding paragraph, has increased the production of one mill on coarse work over five per cent; while another mill, on medium counts, showed an increase of ten per cent in production because this matter was followed up in this manner. Careful attention given to the matter of prudently renewing the travelers as required, will show



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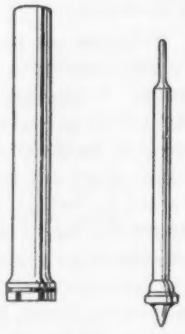

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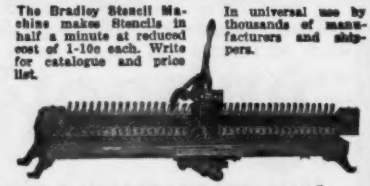

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good results everywhere. The quality as well as the production will be increased, the work will run better and the help will be more contented.

There should be no hesitancy about the extra work or a possible waste of travelers involved in changing travelers as often as suggested, because when the help are trained, the change can be made very rapidly, without an appreciable loss of time or the waste of new travelers. And the great advantages accruing thereby more than offset the extra cost of the supplies and operations.

In connection with this matter, there are many things that can be done to increase the life of the ring traveler. The rings should be kept in good order; all overworn, cracked and nicked rings should be replaced with perfect ones. Also properly set thread guide wires, rings and spindles will impart a balanced movement to the travelers and prevent undue wear. H. D. Martin (R. I.)

## Fly Frames and Differentials.

Editor Cotton:

I see in the January issue that "K. C. (Conn.)" is in tune with the defenders of the fly frame. In his letter entitled "Fly Frames and Differentials," he asserts that I am "wrong in some ways." So I must be right to some degree. Continuing, he states, "And in justice to the makers I want to say a few things in its defense."

Our builders need no defenders, for American-built machinery is equal to if not better than those of other countries. Were the builders to blame for the ostracizing of the Crighton opener about a quarter century ago? Of course not. Cotton manufacturers were to blame.

I fought hard with my pen then for the return of the Crighton opener just as I am now fighting for the return of the flyer-lead system. This is an old idea, but so was the Crighton opener, which today is admitted by most mill men as the greatest cleaning agent.

Where will you find a mill man at this time who would dare risk his reputation by making the claim that the Crighton opener chews the stock and injures the fibers to a large degree? Still that was the cry in those days, and the manufacturers were caught in the swirl and for years our best mills were operated without them.

In the 13th paragraph of his letter "K. C." doesn't consider the fly frame any more imperfect than many other machines in the mill. However, in the 8th paragraph he admits the roving is stretched, but not much. Now what other machine preceding or following the fly frame will stretch it as much? From the 2nd to the 6th paragraph he proves the fly frame is imperfect, and it was more good luck than management that the cones used from the old slubber he mentions had the proper outlines. Then the cones are different, are they not?

This is in line with my arguments. I have argued continuously that variation in speed between one frame and another will require a different cone and that different cottons and different hanks, to give a perfect tension, will require different cones. By having a cone for different ranges of hanks and the frame run at precisely the speed at which the cones were figured out and which the flyers are built, a practically perfect tension is accomplished.

If the reader will closely follow me I will prove these statements. In the September issue I stated that "K. S. (N. C.)" had the right spirit, but the wrong dope on fly frames. Up to this time I have proven every statement. I once stated that changing the bottom cone gear changed the speed of the bottom cone. Well a great many could not see the point. Again, in the October issue of Cotton I said, "If the speed of the spindle will change the outlines of the cone, so will its own speed."

It seems to me that the foregoing statement is clear and should be understood by the practical man, and yet in the December issue, "K. S.," in referring to some of my statements, declared "For a lot of what he has said is so stated that no one could answer it." Again, in the same issue he says, "Doesn't 'Wash' believe the same tightening of ends would have taken place if the correct bottom cone gear had been on the machine and that he had cleaned the cone belt?"

One example or test is worth a thousand arguments. Let any reader make the following test: Change the cone gear from say 31 teeth gear to 33 teeth, and regulate the tension by shifting the cone belt, which in this case calls for a slower bottom cone speed to correspond to the higher speed given to the differential sleeve by a larger cone gear. It will be found that in this case a full set of roving is made with a less working area of the cones, for the reason that the change calls for a contact gear that will give the rack a less amount of movement at the end of each layer. On the other hand, change from a 31 tooth gear to a 29 tooth gear, and the conditions are reversed. The position of the rack must be changed so the cone belt will give a higher bottom cone speed and a contact gear that will give the rack a larger amount of movement at the end of each layer, and in this case a much larger working area of the cones is required to make a full set of roving.

Please be reminded that in finding the true outline of cones each layer of the bobbin of roving must be considered separately, and the diameters of the cones figured for that layer alone. Cones are so many separate pairs of pulleys connected together in a continutinuous string. Therefore, if the cone gear is changed and the rack is shifted to the small end of the bottom cone there is more slippage of the cone belt; on the other hand, if changed to the larger end there is less slippage of the cone belt.

So it must be admitted that changing the cone gear will make conditions unequal which proves I was right in my statement that "K. S." had the wrong dope on fly frames.

However, make the foregoing test and see who is right, and after the test, read the articles written by "K. C." and "K. S." and it will be found their arguments are against the present fly frame and not in its favor.

"K. C." begins the 7th paragraph like the practical man I assume him to be, but spoils it when, in referring to the test I suggested, that if a speeder is stopped, a bobbin gear turned back a little, making the end slack, and the speeder started up, that the slack is taken up quickly, he says, "I admit that it will be taken up quickly, but I do not claim that this is any fault of the fly frame. The slack is taken up more quickly due to the roving being wound on the bobbins more loosely than it would be if it had not been slackened."

He forgets the amount of pressure at the end of the presser pad that insures a firm winding. "S. A. F." has admitted that there is a drag or tension always, between the front roll and bobbin.

Have I not stated time and time again, that a dual oper-

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New York


ation was going on at all times between the increasing diameter of the bobbin and the strength of the strand. The stronger the strand the less the stretch. This is the cause of a difference in twist between the back and front rows of spindles and also the cause of a set of fly frame roving running out unevenly at the next process. Now a variation of three numbers is often found in the yarn. Please look up my article entitled "Taking Hold On A New Job," which appeared in the November 1922 number of Cotton, and let us assume that we are making 48s and find a variation of three numbers, say 51s yarn. Using the figures in paragraph four of that article, we have $48 \div 8 = 6 \times 2$ into $1 = 12$ hank roving. Roving frame draft, 6. $12 \div 6 = 2$ hank intermediate roving. Draft 5 (2 in 1) at the intermediate, $2 \times 2 = 4 \div 5 = .80$ hank slubber roving. Draft of slubber, $4\frac{1}{2}$. $.80 \div 4\frac{1}{2} = .177$ hank drawing. $8.33 \div .177 = 47$ grain sliver. $51 \div 8 = 6.37 \times 2 = 12.74 \div 6 = 2.12 \times 2 = 4.24 \div 5 = .85$ (nearly) slubber hank. . $85 \div 4\frac{1}{2} = .19$ (nearly) hank drawing. $8.33 \div .19 = 43.8$ grain sliver.

Now, did you ever see a variation of over three numbers in the finished drawing? A variation of two numbers is great. Then, what causes the light yarn found if it is not the stretch found on all bobbin-lead fly frames? This it is that I am trying to have remedied by changing the system. "K. C." wanted figures to prove that the fly frame is imperfect. He has them here, and "K. C." and others that defend the bobbin-lead system, will have a hard time getting around the foregoing cause of variation in yarn. I suppose they will claim that they never have a variation of three numbers. I have it, and in some cases I have seen a greater variation.

"K. C.," in the 9th, 10th and 11th paragraphs, tells us about long speeders being the cause of some of the trouble, and like all other defenders admits that you must have the proper cone belt and besides use belt dressing. In the 11th paragraph he tells us he had to use a pliable double belting, and in the 15th paragraph he will not admit that the good working of the fly frame depends on the cone belt. In the 16th paragraph he claims that the cone belt receives aid from the fixed gear (or tight gear) on the main shaft, the one that meshes with the two gears inside of the sun wheel.

If this is true, then why should a longer frame add more work to the cone belt?

In the 18th paragraph, he asks, "Could the cone belt, when called upon to increase the speed of the bobbin gears, do so without the aid of the tight compound gear on the main shaft of a speeder helping to carry the load of driving the bobbin gears?" He should know that the main shaft is run at a constant speed, and as the gear in question is fastened to the shaft, that its speed is constant. Therefore, how can this gear be considered a factor when the speed of the bobbins is increased or decreased? Does this not prove that this gear gives no aid to the cone belt?

Again, what he states in this same paragraph comparing the engine, water wheel, and main lines to that of the cone belt, shows that he forgets that on a fly frame we have two speeds which separate when the cone is stopped, and makes the speed of the bobbins in excess of that of the spindles during winding.

To me it seems strange that "K. C." is unable to see that the cone belt receives no aid from any source, for the reason already explained.

When you wish to increase the speed of the bobbins, you must do so by either changing the position of the cone belt toward the small end of the bottom cone, or change the cone or compound pinion gears. Is not the foregoing enough to prove that the defenders of the bobbin-lead system have the wrong dope?

If conditions were as they are painted by "K. S." and "K. C.," we would not need special cone belting to drive the cone. Any cheap belting will drive the frame, but not the cone. Did you ever hear of a special cone belting to drive the cone of a flyer-lead frame? I never did.

I have driven the bottom cone on a flyer-lead frame with one-inch belting, and not special belting at that. Look up the production turned off per spindle by the old Lowell and Brown fly frames which were flyer-lead, and you will find that our up-to-date fly frames do not come anywhere near their production.

"K. C." has me confused. He ends his article thus, "I may be wrong but I don't think I am, at least not any more so than the makers of the new differential motion when they claim that the cone belt is no longer a driver." The makers referred to claim that the power to drive the bobbin is taken from the main shaft, while "K. C." claims that this same gear is an aid. Therefore, "K. C." is just as guilty, only in a less degree. If he wants to make the following test he can quickly learn how much aid the cone belt receives from the tight gear on the main shaft. When the frame is up to speed, raise the bottom cone or break the cone belt, and let us know how many ends were saved by the main shaft gear.

Winding may continue down in Dixie, as "K. S." says, but I know no winding will take place in Massachusetts, where he claims we have so much junk and where I have bad dreams. But there is a kick to the dream in this article.

Wash (R. I.)

## Evenness, Poor Cotton and High Speeds.

Editor Cotton:

"K. S. (N. C.)" says on page 45 of the November number of Cotton, "It seems there is a lull in the discussion on pickers and the making of even laps. I wonder if the boys have gotten so they can make even laps, or have they given up in despair?"

Now I think my laps are fairly even, but they are not entirely satisfactory, and I don't think that there are many mills where they are entirely so. And I, for one, am still trying to improve them.

"K. S." is right when he says that a whole lap of 50 pounds will not vary more than a half a pound, over or under, and yet the card slivers will have a variation of from three to five grains on either side. Very true. And the variation is more than that in some mills. This is one reason why I think that the carding department should have plenty of doublings to overcome this unevenness of the card sliver. Many times I have heard carders say that they did not have doublings enough for the number of yarn being run, but I have never heard a carder say that he had too many doublings.

"K. S." says that some of the writers were about to agree that an evener was an unevener. Now I think that the evener is a great help in making an even lap. I admit that it is not perfect, but it has not been improved upon for 25 or 30 years, as far as I can see, any more than the compound motion on a fly-frame has been improved upon.

There are some things about a picker that will cause uneven laps and which are not the fault of the evener. First there is the difference in the stock—whether it is damp or dry, and how it is fed to the pickers, and how it is laid on the screens. Every carder knows that if he has been using cotton which is well dried out, and then begins to use cotton right out of the bale, the laps will come in heavy; and I think it is a good idea to let the laps, when weighing, go on the heavy side of standard. If they are put right at standard, the work will be too light when dried out.

The way waste is fed at the opener, or how it is mixed with the cotton opening, will make the laps vary, and I never saw an evener that would entirely overcome these things. If you are running four laps on the apron and one lap runs out, the evener will not take care of the weight delivered so that it is as even as it would be if the lap had not run out. Most carders know this to be a fact.

Some men seem to think that if an evener is moving back and forth on the cones all of the time that it is working fine, and that the work will be very even. I don't think so. The reason why the evener is always moving back and forth is that the work fed in is so uneven. Weigh the work from this evener, and then weigh the work from one that is still some of the time and only moves when necessary, and see if I am not right. Get the feed more even, and then the evener will not shift back and forth so much, and more even laps will be secured.

In speaking about the unevenness in his laps, yard for yard and inch for inch, "K. S." does not state what kind of a beater he is using—whether it is a blade beater or a Kirschner carding beater. I think that the carding beater will make a more even lap, inch for inch, than the blade beater, because it opens up the cotton so much better, and there will be fewer thin places in the lap than with the blade beater. And if a man runs a good heavy feed, at least heavy enough to cover the screen well, he will have a lap that, when compared with a lap made with a blade beater, will make the latter look like an intermediate picker lap or a breaker lap.

Sometime ago I had a carding beater spoiled by a steel lap rod running into it, and I was obliged to put in a blade beater in its place while it was being repaired, and then the laps from this blade beater began to jump in at the feed roll on the cards, and the trouble was not overcome until I got a carding beater back in again.

I know of another mill where the carding beater cured this same trouble. The reason for this is that the carding beater makes a more even sheet of lap than the blade beater, more finely opened up, and this makes it easier on the cards.

"K. S." says carders will take a 50-pound lap that won't vary more than a half a pound on either side, run it through the card, and instead of having a card sliver that won't vary more than a half a grain to the yard they will have a card sliver with from three to five grains variation to the yard on either side. Whoever heard of a card sliver that won't vary more than one-half grain to the yard on either side, or one grain to the yard, as far as

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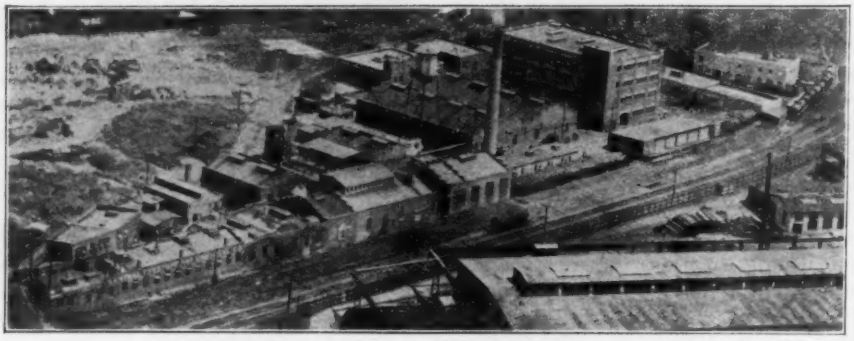

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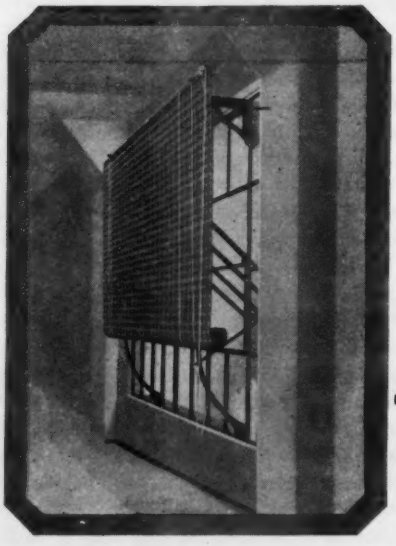

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that goes? I don't say that it can't be done, but I do say that it is not being done at the present time.

When carders become so efficient that they can get card slivers so they won't vary more than one-half grain to the yard, we can do away with the drawing and take the cans of card sliver directly to the slubbers; the work will be even enough without the drawing doublings to even it up.

All carders know that some cards take out more waste than others, even if they are set the same and are on the same stock with the same weight of lap and sliver. Now if this is the case, how are we going to have the card slivers weigh just exactly alike? A sharp licker-in will take out more leaf, motes and short fibers than a dull one will, and two cards with the percentage or stripping plates set just the same, one will take out more waste than the other. Those things tend, I think, to make the card sliver weigh unevenly.

There is a great difference in cotton about its feeding even. When running some openings the feed to the eveners will be more even than when using other openings. The laps will stay nearer the standard weight when using one opening than when using another opening, and the eveners do not move back and forth so much, and the numbers will be more even. The cotton fibers should be even in length; this is a very important feature in cotton, and I find that cotton that is 1 3/16-inch in length, if the fibers sample even, will make better work on fine numbers than cotton that is called 1¼-inch and is very uneven in length. I never could understand how some mills will try to get by with a cheaper grade of cotton than they ought to use for the number of yarn which they are making. I never could see where there is anything gained by it. If you put in cheaper stock—and here is where Wash's law of compensation gets in its work—you will pay at every process from the opener to the loom. There will be a loss in production, more waste, and bad running work. *How* the work runs is a vital point to be considered, for a mill where the work runs very badly cannot hold help so well as a good running mill, and I find that operatives will stay at a mill where the work runs good, even if they don't make quite so much pay. Many times mill managers will try to make fine numbers out of stock which is not fit for the numbers of yarns wanted. And then, in many cases, the superintendent and overseers will be blamed for the poor running work. It's in the stock, and not the fault of the men in a great many cases. The stock must be right at the start, and that is about half of the battle of success, I think.

I once knew of a mill where the work was running very badly, and the company was losing money. The superintendent and overseers were discharged several times and new ones hired. Finally a new superintendent when taking charge of the mill told the owners that they must get better stock for the numbers being made. Well, it was some time before he could persuade them to do so, but finally they consented and put in better stock. The work commenced to run better and instead of being a losing proposition the mill was a paying one. This, I believe, could be done at other mills also.

High speed is another evil in many mills today, and there are a great many mills where some of the machinery could be slowed down, and get just as much production, and a much better quality. Because the belts would be on the tight pulley more of the time, due to better running work.

What is to be gained by driving machines at a high rate of speed if they do not get off any more work than they would with lower speed? High speed wears out the machinery more quickly and takes more power. Another thing to be considered is that if a mill has an extra high speed, there must be a better class of operatives on the machines to handle the work; they must be faster and more efficient in all ways than would otherwise be necessary, or else the belts will be on the loose pulley a good part of the time. And one cannot always get fast and efficient operatives now-a-days.

And now, before closing this letter on evenness, poor cotton, and high speed, I want to say that if "K. S." hasn't got intermediate pickers, that those nice, even intermediate picker laps would surely help him to get a more even lap at the finisher pickers, for the more even the feed is to the finisher pickers, the more even the laps will be, whether it is a whole lap, yard for yard, or inch for inch. For the more even the feed, the less the evener will have to do, and the result will be a more even lap in every way. Too much is expected of the evener in many ways. It is very easy to criticize the evener and its imperfect work, especially on the part of the younger carders, and I don't doubt but what the new school of carders will make the "old-timers" look like thirty cents in years to come. But up to the present time, while they are able to point out the imperfections of the evener on pickers and the compound on fly frame, they don't seem to be able to improve either one.

K. C. (Conn.)

## What Can We Do to Promote Goodwill Among Our Operatives.

(*Continued from page* 456.)

which can be brought about by the preceding devices.

Assuming that we have progressed thus far, we have one more factor which enters in and that is the individual's willingness to work. It matters not how able he is through his mental and physical fitness; he will not work and produce unless he has the willingness to do so. Therefore, we should consider those things which build up and strengthen our operatives' willingness to work.

Good running work in the cotton mill is essential. Wages should be based on a piece rate wherever a piece rate is possible and this rate should be made a fair rate, determined not by a hit or miss process, but by a scientific study in which the operative will enter in and give his assistance to the management. When a man realizes that the rate he is paid is based upon the average man's ability, through a fair and conscientious study of that job and that he is making what he earns, then contentment is sure to follow.

The realization that our efforts are noticed and rewarded, not only from a mercenary standpoint, but acknowledgement in one way or another, surely makes you and me feel like going on. It is only human nature that we are willing to try again. Insurance benefits, group life insurance and the taking care of men and women who have put in thirty or forty years of service and many other things which time will not permit me to mention, tend to make us all willing and anxious to carry on loyally.

I find in life that one of the main reasons for unwillingness in anything, is the fact that there is misunderstanding,

and a great deal of unjust criticism can be laid to the door of misunderstanding. I am reminded now of a story of the Dean of a Scottish University. A group of lads were lined up for their matriculation papers and the dean, a gruff old man, looked down the line and asked: "Have you your registration blanks? If so, put up your right hand." They all put their right hands but one lad and he put up his left. The dean, noticing this, shouted at him: "Hey, there! Don't you know your right hand from your left? Why don't you put up your right hand?" The lad answered: "Sir, I have no right hand." It was later learned that the lad had lost his arm while saving the life of a child, and the dean made up his mind then that he would not criticise the other fellow until he understood all the conditions.

When the day comes when each factor in industry will sit absolutely openminded and with one objective which is the good of each other; when policies and plans for the betterment of the whole will be discussed freely and decided honestly; then, and not until then, will we have the maximum amount of willingness. Contentment will follow. A man whose mind is warped with misunderstandings, a feeling of distrust, and the lack of confidence, cannot work.

What the industrial world needs today are channels through which the man at the front, as it were, can understand and know and have confidence in the men of the management who are contributing all their brain power, and they in turn wholly know and realize the sentiments and high ideals of the investors. When the three legs of the table of industry realize that each one is a factor in the whole scheme of things, then and not until then, will we have an absolute Utopia in industry.

## Mill Fire Departments.

Editor Cotton:

As this is Fire Prevention Week in my home town, I thought it would be an opportune time to sit down and write a letter on fire protection for the mills, where there is a great deal of money and lives depending upon a fire department for protection.

The city has an up-to-date fire department and a large one at that, but the large fires always start from small ones, and if the small ones are put out then there is 75 per cent of the loss saved, and by the mill's own fire department, which is a great help to the city's department.

By this I don't mean that the mills should be dependent only on their own fire department for protection. Far from it. But there are a great many small fires that start in different parts of the mill that it would take quite a little time and water and damage to bring under control by the time the city fire department arrived, whereas if a mill had a squad of men drilled and trained for fire fighting, what an easy matter it would be for them to have two or three lines of hose laid and water on the fire by the time outside help arrived—meaning a saving of money and stock and possibly of lives.

Before going further, I want to make it clear that these mill firemen are not paid as firefighters, but are men in different departments throughout the mill. I will describe the methods used by two mills, such as the equipment, and the training of men for firefighting, etc. One of these, I am glad to say, is well protected from fires and I am sure it could take care of itself without any outside help if it had to.

In starting, let us call these Mills A and B. Mill A got together a few men who were willing to give their noon hour twice a week for drills on laying a line of hose, connecting to hydrant and playing a stream of water on a fire, etc. These men were drilled by an overseer or some other man, and at one o'clock went back to their places in the mill; anyone could join as there were lots of vacancies in this home-made fire department.

That was Mill A. Now let's see the difference at Mill B. What I say in this letter I saw, and it was just my good fortune to be visiting in this town, a friend taking me to one of the drills, and let me say it was some drill. All the overseers were in this fire department, also the second-hands and third-hands, the machine men and the carpenters, the yard men, had charge of hose and stood by the hydrants at all times. Working in and around the mill yard they knew just where each hydrant was.

This friend of mine, knowing how it would interest me, and knowing also my position in the mill, had a talk with the superintendent of the plant, who, being a very nice man and very proud of his firemen, consented to a drill. Ten o'clock was the appointed hour and my friend and I were at the mill office.

Mr. Superintendent pressed a button and in another moment the gong rang and there was a rush of men from all directions. The yard men were at their stations, the hydrants, each overseer took charge of so many hydrants and men, the men ran for the hose, connected them up, and had a stream going in a very short time. The overseers gave a few orders and went back to their departments, leaving the second-hands and third-hands to stand by. After the imaginary fire was under control the third-hands were sent in to their rooms.

Thus we see that the mill lost no time and having the overseer and third-hands in each department, the work went along smoothly. I glanced in another direction and saw a woman running towards the men. My friend told me that she was the mill nurse, answering all fire calls and rendering aid if needed.

After an hour's work the superintendent again rang the gong and the second-hands went back to their rooms, and the yard men took up the equipment and put things in order again, under the direction of the yard overseer, who went from hydrant to hydrant to see that everything was okeh.

T. A. B. (Mass.)

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The fourth of the series of instruction booklets has been issued by Crompton & Knowles Loom Works, Worcester, Mass., this dealing with the "Automatic Stationary Magazine." The complete series will include seven of these booklets, the three subsequent sections to be issued at intervals in the near future.

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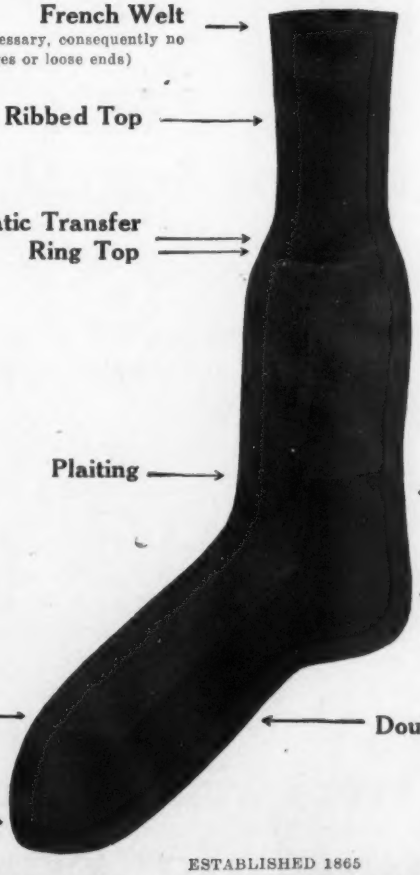


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# Winding Knitting Yarns

BY WILLIAM DAVIS, M. A.

Remarkable attention has to be given to the operation of winding knitting yarns as compared with other branches of the textile industry. The operation appears a subsidiary one in most cases and its treatment in the knitting industry must follow on the lines of one of the most important operations dealing with this branch. The reasons for this may be specified. The knitted fabric, in most of its variations, is more or less of a uni-thread structure, the thread makes the fabric and the continuous thread makes the continuous fabric. In woven goods we have in warp and weft a series of threads, and the irregularities in individual threads are leveled out, so to speak, by the comparative perfection of the others and the fabric amenity is preserved. This is not the case in the knitted fabric where the least variation in the yarn is at once registered in its full meaning in the fabric standing clear on the surface as a blemish or defect. The winding of material for the loom is restricted to bobbins of a limited size which shall not be too heavy to throw across the lay or going part, but in the knitting machine the bobbin is stationary as a yarn package, at least it has not to be thrown across a limited space which restricts its size. This gives a great advantage to the knitting machine because large packages can be used so that a minimum of stoppage of the machine is required to renew bobbins.

There is, however, another point which makes winding of paramount importance in the manufacture of knitted goods, and that is the susceptibility of the knitted fabric to variations of tension in the thread supplied to it, the smallest pulls and jerks on the thread being, in most machines, shown in variable fabric texture; these effects are reduced considerably by the thread regulators now fitted to most machines and also the stop motions with which most are equipped, but in many branches of the knitting industry there is still an antipathy towards using the cross wound cone as delivered by the spinner. By cross winding is meant that the yarns are wound onto the package with a very rapid traverse of the thread so that a thread appears at the lower edge of the cone and the upper edge in rapid succession.

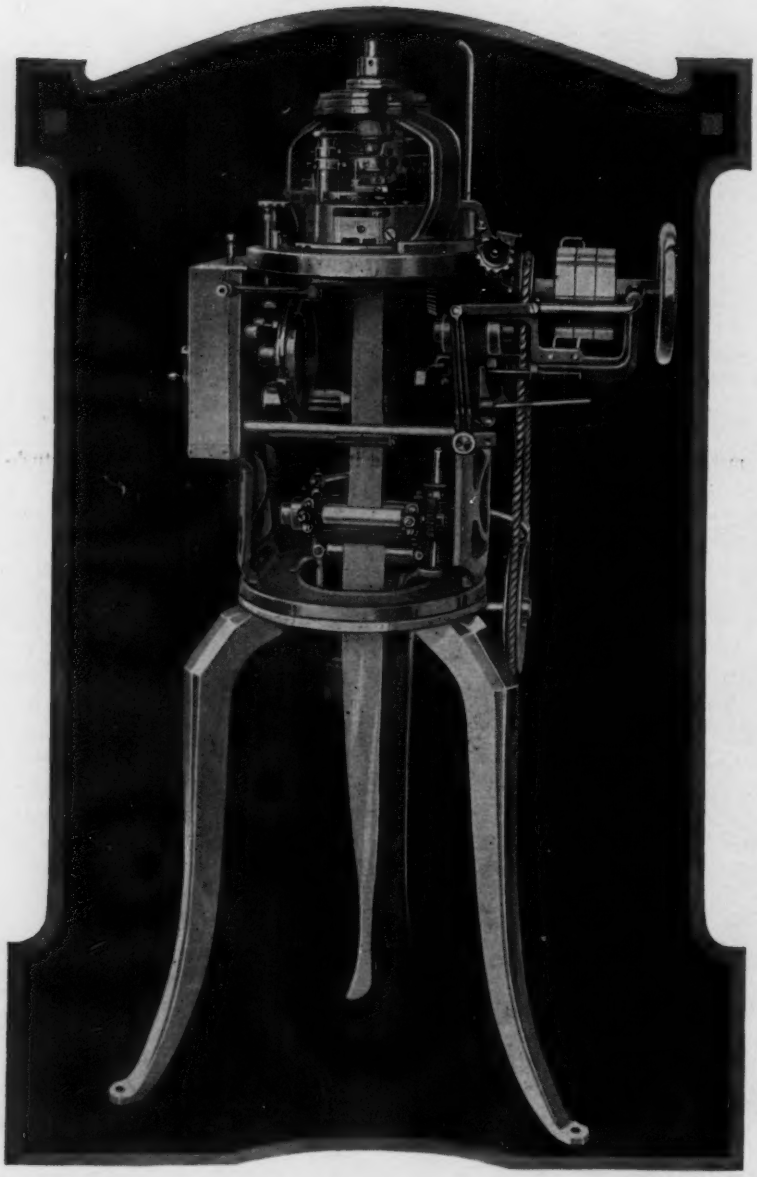
Most manufacturers prefer to re-wind their yarn onto the bottle bobbin, which, as the name suggests, is shaped like a bottle, with the point tapering at the top. The yarn is wound onto the bobbin with one layer touching its neighbor, each layer abutting the next in a regular succession of yarn from the bottom to the top. These bobbins are made very long, about 10 to 12 inches, and so can take a heavy weight of yarn for the frame. By this method of wind there is a minimum of air friction as the yarn issues from the package into the knitting machine, and there is no risk of the yarn falling over the edge of the bobbin thus getting caught and effecting a press-off of the loops.

It is not here asserted that cross wound cones are not found in knitting factories in large quantities, being worked on web producing machines and stocking manufacturing machines, but it must be stated that where the class of trade is of the better type, the manufacturer is more easy in his mind to have the yarn re-wound onto the bottle bobbins with a wind which shows the succeeding layers of thread touching each other right up the bobbin, as these give more perfect results in the knitting machine.

Very closely allied to the subject of yarn winding for the knitting industry is that of suitable preparation of the yarn for the knitting process which is generally done on the winding machine as the thread is passing on its way to the bobbin. One of these attachments consists of two plates screwed quite close together and adjustable so that as the thread passes through on the way to the bobbin any slubs or burrs will be drawn out of the thread. The best judgment on many of these thread clearers, as they are called, is the fact that large numbers of them fall into permanent disuse. The workers never adjust them to draw out the surface obstructions, because in screwing the plates together they have to be pretty close to become effective and then they ruffle the thread itself and render it rough by disturbing the fiber arrangement and reducing the strength. There is also the friction on the yarn and the fact that in drawing out these obstructions the thread often gets broken in the process. The best remedy is to pay a little more for the yarn and thus obtain cleaner spun yarn, for these obstructions and burrs can be removed to a large extent in spinning and preparatory processes, but if the yarn is demanded at a low price the spinner is forced to omit some of the cleaning processes to get a larger output.

In ordering yarns, this aspect should be kept carefully in mind by the prudent manufacturer; when his agent tells with glee of the way he has scored by getting a cheap yarn, its performance should be scrutinized throughout all the manufacturing operations to ascertain how much loss is incurred in yarn breakage, needle rupture and ruffled surface due to the necessity of employing tightly adjusted thread clearers. He has also the status of his finished article to consider for on this his whole reputation as a manufacturer of approved fabrics may be said to depend.

Under present manufacturing conditions many yarns have to be suitably treated on the winding machine to render them more easily knitted. Dry yarns give trouble on the machine owing to the small straight portions of the stitch which appear at frequent intervals thus spoiling the appearance of the texture and considerably reducing its value. Manufacturers are not particularly satisfied with the paraffin wax generally used on the surface of the thread, the method being to run it between two cakes of the wax, which renders it softer and more easily knitted, this is for cotton yarns particularly, and sometimes woolen. When the goods have to be treated subsequently either in bleaching or scouring, the complaint is often heard that the wax affects the finish of the fabric, particularly waxes of certain compositions. The method for woolen materials is the well-known oil and soap emulsion process whereby the threads are passed through a solution of this on the way to the yarn package. If this is to be effective it has to be worked on the machine very soon after treatment, the same day if possible, or the lubrication value is reduced. This system is troublesome, as the lather requires to be kept warm; there is also the variable character imparted to the thread according as it is wet, semi-dry or almost dry. At each stage it has a different proportion of stretch and this introduces variableness in the size and shape of the gar-



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NORRISTOWN, PA.

ments making a dozen goods by this system rather a mixed lot according to the degree of lubrication given to the yarn in individual garments.

Some of these points may be brought into clearer relief by a reference to one of the standard machines for winding yarn onto the jumbo bobbin which is extensively employed for hosiery work. Figure 1 gives a view of such a machine, which illustrates a class of winding engine extensively used. The bobbin spindle shown at BS this being the rod on which the bobbin is placed, the bobbin having a groove at the bottom into which a raised lip fits at the bottom which insures its being kept in position. The bobbin is driven from below by means of the friction wheel FW on the surface of which the driving wheel DW operates. The driving wheel is fixed on a shaft which revolves and the surface of the wheel is covered with leather so that it will grip the rougher surface of the friction wheel above. The friction drive has the advantage of giving a little play to the bobbin and enabling it to be stopped by hand on occasion and preventing minor accidents which might be caused to the wrist of the worker were the drive a positive one. The finger F is used to place the bobbin in and out of winding action and has the effect of raising the friction wheel FW out of contact with the driving wheel DW, thus stopping the bobbin. When the bobbin is full the friction wheel is automatically raised out of contact with the driving wheel.

The other part of the motion deserving mention is that connected with the rail R attached to which is the contact wheel W, the yarn guide YG, the spiral screw S which brings about the gradual upward movement of the yarn guide as the bobbin fills. The rail is made to rise and fall by the action of the heart shaped cam HC working on the lever L which in turn is connected with the rail and causes it to rise and fall. The movement of the rail in the upward direction is positive, that is it is raised by the action of the point of the heart shaped cam as this revolves, the diagram showing the cam in its lower position. When the rail has been pushed to the highest position L passes on the lower level of the cam as shown and the rail descends by reason of its own weight, a feature to which we will return later as being one of the subjects for improvement in the winding engine. The rise and fall of the rail is regular and the height is capable of some adjustment by the runner on the level L which may be increased or diminished to give a higher or lower lift to the bobbin.

The strong feature of this method of winding is the system of bobbin building adopted, which proves admirably suited to the requirements of the hosiery trade. The side by side laying of the thread in this machine gives a perfectly even withdrawal of the yarn from the bobbin and this is the great desideratum in knitted goods. One coil is laid by the side of another coil, just touching it, and the bobbin is wound in the most scientific manner by the differential in building.

This can be explained more in detail by referring to Fig. 2 which is a front view of the machine just described where the various parts will be recognized by their identical lettering. The differential is obtained by the side to side motion of the shaft holding the driving wheels DW, the rim edge of which is seen to be traveling over the disc of the friction wheel FW. On the lower part of the rail bar RB is attached a slotted piece SL in such a position that as the rail bar rises and falls the slotted portion pushes the shaft with its driving wheels to the left when it rises and back again to the right when it drops. This causes the driving wheel DW to travel from side to side; to the right it reaches the extreme edge of the rim, and towards the left it moves almost to the central pin. In so doing it is clear that the speed of the bobbin spindle varies differentially, when on the outer rim the speed is at its lowest and increases as it approaches the inner position when the pace of the bobbin is at its highest. This increases gradually and depends on the position of the driving wheel on the rim.

This slow and fast turning of the spindle is timed to coincide with the rise and fall of the rail during its regular traverse for the throw of the yarn guide. When the guide is at its highest position it is placing yarn onto the bare bobbin and so a turn of the bobbin will only wind say three inches of yarn. When the rail is at the bottom of its

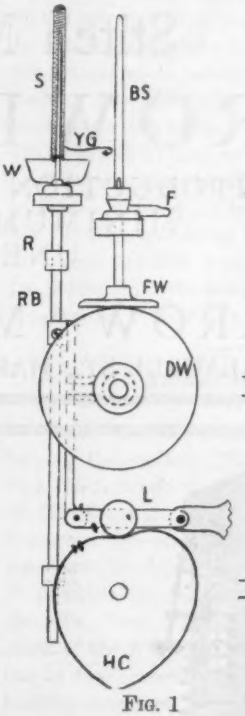


Fig. 1

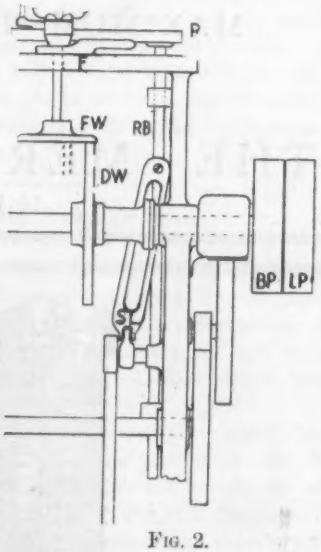


Fig. 2.

traverse it is running yarn onto the point where the bobbin is already full and one turn may wind on seven or eight inches. Therefore, the great object is to keep the yarn passing onto the bobbin at a regular rate and the differential is timed so that it turns the bobbin fastest when the guide is at the top of its traverse and slowest when the guide is at the bottom of its throw.

The machine is driven from the side by means of a fast and loose pulley, the two pulleys being placed side by side, LP being the outside loose pulley and BP the inside driving pulley.

This machine is built in various modifications, one of the most important being the position of the runners for hank winding for which it is specially adapted. In one form the hanks are placed on runners beneath the bobbin and in the machine now being described the runners are placed over and behind the bobbin.

When the hanks of yarn are placed above the worker the system is open to objections from hygienic experts who declare that in drawing the yarn off to unravel it the worker

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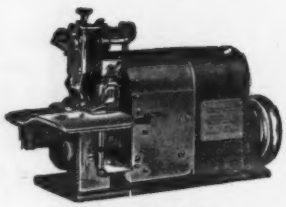

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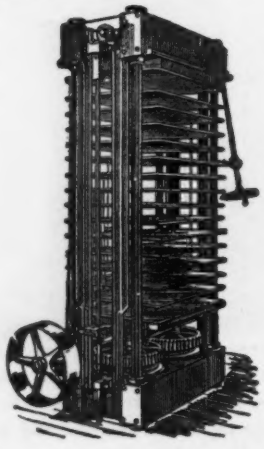

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breathes the minor fragments of cotton and wool into the lungs; and the fragments also settle in great quantities in the hair of the worker to prevent which it is customary for them to wear a cotton cap during work. When placed overhead the hank of yarn is more accessible to the worker who can reach them with a very slight forward movement of the arms and the material is well within the eye line during treatment so that any catching of the thread is at once noticed and put right.

When the hanks are placed on runners underneath the bobbins, the worker has to operate below the eye line and to reach to the lower part of the hank, has to bend the back which induces greater fatigue. On the other hand as the material is below the level of the mouth the particles of material are at a lower strata and are not so readily absorbed by the lungs of the workers.

These matters are now claiming more attention from machine designers and government action is forcing the matter of factory hygiene and factory fatigue very much to the front in countries on both sides of the Atlantic. Manufacturers who have the interests of their workers at heart consider the effect of all processes on their health and consider the question of industrial fatigue. If in the winding operation the worker has to bend the back hundreds of times a day unnecessarily, then this will reduce the output and it saps the energies and lowers the level of productiveness; indirectly this will tend to increase costs because higher wages have to be granted the more laborious the operation becomes. Machine design has also to be examined in the light of noise, and in this particular the machine being described is a rather bad offender. The rise and fall of the rail, the pushing of the slotted part and the sliding of the shaft containing the friction wheels with the sound caused by frictional contact all contribute to give to such winding machines a peculiar combination of rubbing and rattling which schedules it is a factory noise which it is desirable to reduce or eliminate. The winding department of most factories are unnecessarily noisy during work and machinists are directing their attention to minor modifications which will reduce this.

In the machine under consideration the latter point has been improved in a recent type where the drive of the bobbin spindle takes place by means of a band which connects it with a central revolving drum after the manner of driving the spindles of the spinning mule. This eliminates the frictional element in the noise connected with the winding machine and the new type works more silently. In band driving, however, there is a tendency to slip as the band becomes slacker through stretch and this throws the relation of the speed to the traverse out of time and produces uneven results in winding.

In machines of this type it has been mentioned that while the bobbin rail and spiral screws are raised positively by the action of the high part of the heart-shaped cam, the downward motion of the rail takes place through the action of gravity, the dead weight of the rail causing it to slide down. When this is taking place along a wide winding machine, the rail is heavy and the downward speed tends to accelerate more than should be and irregular results are obtained in winding. The dead weight of the rail rushes the heart shaped cam in the downward movement and produces uneven winding. This also gives to the working of the machine considerable vibration which is not desirable in an operation such as winding where smooth running is the aim. In recent modifications of the winding machine, wide machines are built in three sections, in the first the heart-shaped cams are screwed on as shown in the sketch, in the second section they are attached one third of the diameter further around and at the third section they are added another third round the circumference with the result that the whole shaft is balanced in its working; in place of all three guide rails coming with their weight on the cam at the same moment the weight is distributed in different phases of the cam shaft and the speed of this remains steady and regular all the while.

Another feature which is a disadvantage in the winding of artificial silk is the contact wheel W. When the yarn is wound to the required height, the yarn comes in contact with the wheel and giving it a turn causes it to rise higher on the spiral rod and thus cover a higher part of the bobbin. In winding artificial silk the layers are easily disturbed and the contact wheel induces ravelling of the layers and causes waste. Also, the bobbin is heavy and in winding this material from the hank, when the thread catches the weight of the bobbin in turning it breaks the thread. Now knots in artificial silk must be avoided at all costs and new modifications in winding artificial silk have the double-ended bobbin working on rollers with a light frictional contact so that when the yarn is caught in the hank, the thread stops the bobbin until the worker unravels it. In this way much breakage is avoided.

## Among the Knitting Mills.

Vance Knitting Company, Kernersville, N. C., are enlarging their plant. The new building is approximately 50 x 100 feet, two stories, and will give an ultimate capacity of 500 dozen hose per day of ten hours. A new boiler house and dye plant will be added. J. E. Sirrine & Company are the engineers.

Riceville Hosiery Mills have moved their plant from Riceville, Tenn., to Bristol, Va., and have taken over the plant of the Wood Hosiery Mills, Inc., and are now operating as the Tenneva Hosiery Mill. The mill operates 174 knitting machines, 75 ribbers, 30 loopers and three sewing machines.

The Cartex Underwear Co., Reidsville, N. C., has been incorporated with a capital of $150,000 by William H. Carter, president, and W. L. Pannil, treasurer, and has purchased the plant of the P. H. Hanes Knitting Company at Reidsville. The plant will be equipped with machinery for the manufacture of men's cotton ribbed underwear, starting with a capacity of about 200 dozen a week. Mr. Carter is the president of the William Carter Company, of Needham Heights, Mass., and this company controls a majority of the stock of the Cartex Underwear Company.

The Ballard Knitting Co., Norristown, Pa., has acquired property at Royersford, Pa., and is said to be perfecting plans for the establishment of a new branch mill.

Edenton (N. C.) Hosiery Co., Inc., will modernize their plant, install new machinery, build cottages for operatives, etc.

Nicholson Hosiery Mills, Chattanooga, Tenn., have been granted a charter with a capital stock of $50,000. The incorporators are F. C. Nicholson, M. J. Nicholson, R. L. Westcott, A. C. Faust and J. L. Faust.

Cheraw Knitting Mills, Cheraw, S. C., formerly the Pee Dee Knitting Company, have ordered an equipment of machinery for the manufacture of their own supply of knitting yarns.

The Republic Knitting Mills, Inc., 1227 Twelfth Street, Detroit, Mich., has arranged for an increase in capital from $50,000 to $100,000, for proposed expansion.

The Fairdeal Knitwear Co., New York, N. Y., recently organized with a capital of $12,000, will operate a local plant for the manufacture of a general line of knit goods. J. and R. Leibowitz head the company, which is represented by C. S. Amsel, 984 Broadway, New York.

The Rosenben Knitting Mills, Inc., Brooklyn, N. Y., recently incorporated with a capital of $50,000, has arranged for the operation of a local plant. The company is headed by R. Maltz and E. Gabay. It is represented by A. J. Halprin, 41 Park Row, New York.

The Perfect Knit Mills, Ltd., Listonel, Ont., has plans in progress for the construction of a new local knitting mill, estimated to cost in excess of $75,000. Bids will be called at an early date. A list of machinery is now being prepared.

The Huntingdon Knitting Co., Wilmington, Del., has been organized under state laws with a capital of $30,000, to establish and operate a knitting mill. The proposed plant, it is stated, will be located at Huntingdon, Pa. The company is represented by the Delaware Registration & Incorporators Co., Wilmington.

Bids are being asked for the construction of a new seven-story knitting mill, 80 x 130 feet, to be located at Thirty-third and Arch Streets, Philadelphia, estimated to cost in excess of $100,000. The structure will be occupied by a new company to be known as the Kraftsow & Titelman Co., recently organized by I. S. Titelman, head of the Puritan Knitting Mills, Juniper and Vine Sts., and associates. Frank E. Hahn, 1112 Chesnut Street, is architect.

Doyle & Scriggins, Inc., New York, N. Y., recently organized with a capital of $50,000, propose to operate a local knitting mill. The company is headed by E. J. Scriggins, and F. J. Doyle; it is represented by E. D. DeRemer, 60 Wall Street, New York.

The C. & G. Knitting Mills, Inc., Brooklyn, N. Y., recently organized under state laws, with a nominal capital of $5,000, will operate a local plant for the manufacture of a general line of knit goods. I. Coleman heads the company, which is represented by L. L. Devine, 1645 Pitkin Avenue, Brooklyn.

The Friedman-Rothkopf Knitting Co., Brooklyn, N. Y., recently formed with a capital of $14,000, to manufacture knit goods, will operate a local mill. The company is headed by M. Friedman and M. Rothkopf. It is represented by J. Berg, 957 Broadway, Brooklyn.

W. F. Hufford, Weissport, Pa., has organized a company and will establish a local knitting mill in a structure to be known as the Hufford Building. Machinery will be installed at once.

The Adrain Knitting Co., Adrain, Mich., operating a local mill, has arranged for a change of name to the Lenawee Knitting Co., and a dissolution of the Adrain company has been filed with the secretary of state. The new organization plans for extensive operations, including mill expansion.

---

A man's ability should be rated by what he finishes and not by what he begins.

## A Steel-Asbestos Textile Dryer.

An insulated steel textile dryer is being made and marketed by the Dryer Corporation of America, Warren, Ohio, under what is known as the Miller system, which they describe as follows:

"The improved Miller construction consists of the frame of the machine being drawn to the proper shapes and accurate sizes with a "V" projection in these frames. The shapes with the special "Vs" are all one piece of drawn steel. The panels that enclose the machine have a drawn steel "V" moulding around all the edges. The "Vs" in the moulding fit the "Vs" in the drawn "Vs" of the frame. This improved construction makes an air sealed joint between the frame work and the panel.

"In addition to the "V" moulding, the panels are made of two sheets of steel, electrically welded to this moulding, making a sealed and dead air space panel with one inch of 85 per cent magnesia filling between the two sheets of steel for insulation. The drawn steel frame is also insulated with 85 per cent magnesia.

"Heating coils are of standard pipe and fittings tested by hydraulic pressure to insure their being perfect. These coils are supported by drawn steel members, when in the dryer. Care being taken to insure that each pipe has the proper fall, so that the condensation is properly drained from the coils.

"Fans of suitable design and accurately balanced are supported in housings with ball bearings running in oil, insuring that each bearing is properly lubricated. Bearings that support the fan inside of the enclosure are protected by an improved fire cone case. This case not only protects the bearing from excessive heat, but also prevents any oil from being thrown on the material being dried, or the inside of the dryer. The outside fan bearings are supported by a curved bracket. This curved bracket overcomes overhang drives.

"Package type dryers are provided with means to contract the air movements and distribute them uniformly through the material to be dried. Means are also provided to exhaust the proper amount of moist air and admit fresh air to replace the moist air expelled.

"Conveyors for the automatic dryers are designed to give the longest wear. When chains are required they are of the roller type and machined from cold drawn steel.

"Automatic machines requiring wire cloth aprons have the machine made chain, with supports from one chain to the other chain, and the wire apron is attached to these chain supports thereby removing all strain from the wire cloth apron. Conveyor speed control is obtained within a certain range."

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H. C. Meserve, secretary of the National Association of Cotton Manufacturers, Boston is the author of an interesting volume entitled "Lowell—An Industrial Dream," which has just been published by the National Association. The book takes up the history of the cotton manufacturing industry in this country, and, in an interesting manner, develops it into the present plane of the business in the city of Lowell. Chapters discuss practically every phase of the subject.

The book contains 126 pages and four portrait illustrations, with three graphic charts.

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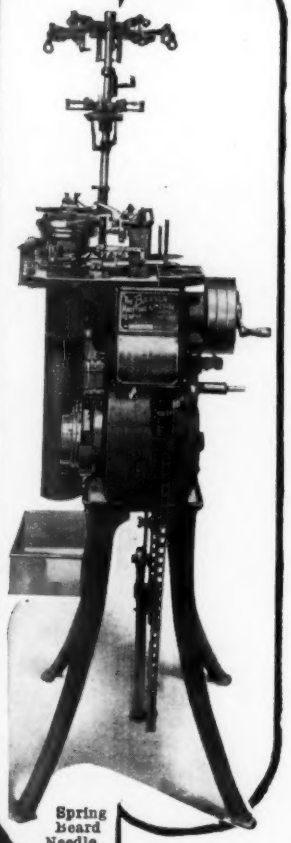

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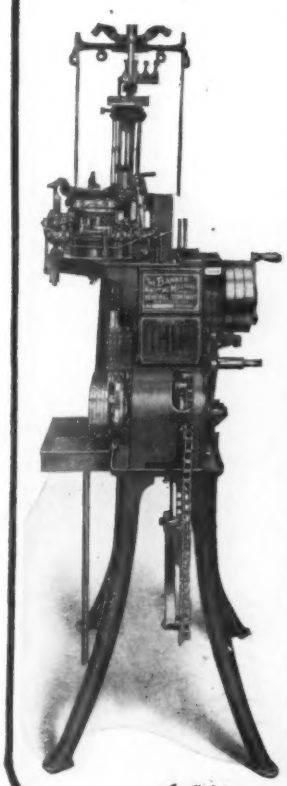

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# The Knit Goods Market

Thirty-one cent cotton, $9 raw silk and wool prices at the top seem to have given jobbers no inspiration to stock up with hosiery in March, in advance of manufacturers coming out with higher prices based on the ascending cost of raw materials.

Distributors had bought cotton hosiery in fair volume for the first quarter of the year, but comparatively few have provided for more than a small fraction of their requirements for the second three months. There seemed to lurk the fear that the country was well advanced toward another period of inflated values. Memories of the 1920 collapse of post-war inflation could not be pushed into the background. But March prices of cotton knit goods may be said to have been so low that merchandise in stock and on commitment is an absolutely safe investment.

Jobbers who admitted they were not a little exercised over the probable effect on business in cotton hosiery when it must be quoted on the basis of the then yarn market, were buying ultra-cautiously, while pointing out that much of the hosiery going through distribution was priced on the basis of cotton around 18 and 20 cents.

About one year ago southern carded yarn was being bought by manufacturers at 30 to 31 cents, basis of 10s single, and mercerized on the basis of 92½ cents for 60s southern 2-ply combed peeler. The advance to March on the combed peeler was less than 8 cents a pound, while the carded had moved up 14 cents.

With hosiery for April to May delivery priced on yarn at 31 cents and the trade fearful to operate, it is difficult to imagine what may be the attitude when 45 cent yarn must be used. One buyer said jobbers would not look at samples.

Distributors affect to believe that present cotton quotations represent nothing more than speculators' wagers; that no yarn ever will be spun from cotton costing spinners as much as 30 cents. They spoke similarly of cotton when it crossed 20 cents. There seems no doubt the trade was holding back in expectation or rather, hope, of a break. But the thirty days to mid-March embraced several short periods of brisk operating in hosiery.

Several hosiery mills making misses combed ribs on a somewhat large scale had phenomenal business, booking in a few days enough orders to warrant them withdrawing their lines for a time. Mills obtained substantial advances, one of them selling at $1.75, which is an increase of 15 cents a dozen. Another mill has restored its price of $1.80, after having been unsuccessful with an advance of 5 cents; and still another set $1.90 as its minimum.

Low end cotton goods, after a buying spurt six weeks or more ago, have been quiet. Mills are running on orders placed then at prices based on $1.05 to $1.15 for men's 176 needle goods and $1.07½ for women's, but no new or duplicate business of any great moment is being placed.

Jobbers' explanation for their restricted buying in March was, in part, that retailers as a class did not have a profitable February, and it was stated many were tardy about taking care of maturing invoices. They were waiting for a bumper Easter trade for compensating for the slack in February. The situation was not helped by the near blizzard in the middle states in the second week in March, when France was pushing farther into Germany. All this adding to the confusion over advancing prices and supplying a pretext for deferring commitments.

Possibly an important factor in distributor attitude was the well grounded belief that potential production of cotton hosiery is so far ahead of needs under normal conditions that manufacturers always can be depended on for supplies for stockings. This proved an erroneous notion, for many a buyer was unable to obtain desired deliveries, numbers of manufacturers of carded, combed and mercerized hosiery having sold as much as they were willing to sell before contracting for yarn at higher prices.

There was an improvement in sales of ladies mercerized hosiery, yet a northern mill discontinued the manufacture of all mercerized lines, solely for the reason that it could not compete in price with manufacturers in the South, who, it was held, were favored with a much lower wage rate. It was shown that a northern mill had been paying 18 cents a dozen for knitting, and due to a scarcity of help, was compelled to increase this to 24 cents, while the manufacturer of an almost identical line in the South was paying but 13½ cents a dozen. Looping cost a northern manufacturer 10½ cents a dozen, in contrast with 6¼ cents, paid by a mill in the South. Taking the lower northern rates for knitting, the two operations cost the northern manufacturer 8¾ cents per dozen more than the cost to his southern competitor, or 14 cents more if the difference be figured on the higher cost of knitting in the northern mill.

A really good 220 needle mercerized stocking for ladies is costing retailers $4.25 a dozen and they are selling it at 50 cents a pair and having considerable business, in some sections. One of the more important manufacturers selling to retailers direct reports that his sales of ladies mercerized for the first two months of this year amounted to about 40 per cent more than for the corresponding period of 1922. There was a similar increase in the business of this mill in misses mercerized, and a phenomenal jump in the sales of ladies ribbed top goods.

Women's mercerized mock-seam hosiery, offered to jobbers around $2.65 has been fairly active, but full-fashioned mercerized goods continue dull. Distress prices quoted some weeks ago by a number of sellers served to liquidate surplus stocks to a large extent, but prices moved back to their former levels around $7.50 to $8 for 39 gauge grades, which are generally regarded as too close to silk prices to attract many orders. There are still goods to be had on a basis of $7.50 to $8 for 42 gauge mercerized.

Well made hosiery of combed yarn, for men, women and children held steadily during the period of quiet buying. It more nearly conforms to distributors' ideas as to price, and probably takes preference over mercerized among many persons who have not adopted silk stockings as a part of their wardrobe. Combed yarn goods probably have been a better seller, relatively, than mercerized.

Silk hosiery is in somewhat better inquiry from jobbers, although they have said retailers as a class were pretty well covered with silk goods for another month or two, and that so long as they were in doubt about the volume of their Easter business they would proceed very cautiously, uncertain as to whether in the end they would be able to move the average seasonal quantities of hosiery.

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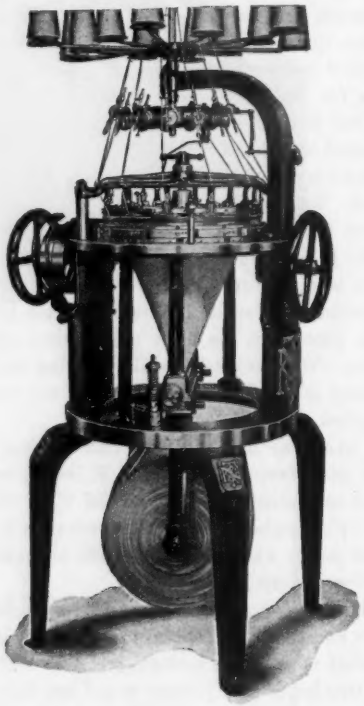

# DEPENDABLE

production and economical operation have combined to make NYE & TREDICK knitters popular for a generation in those mills where fabric of the highest quality is made at a price which assures satisfactory margins.

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*Successors to*
**NYE & TREDICK CO.**
**WILMINGTON, DELAWARE**
*Cable Address—Trumpbro—Wilmington*
*Southern Agent—H. F. Booth, Cheraw, S. C.*

The waiting attitude of distributors is reflected in the very low prices at which some manufacturers are offering their goods, one jobber stating he really believed he could buy certain mill lines of both seamless and full fashioned at no more than the actual cost of production, based on raw silk at $2 a pound less than the present market.

Novelties and specialties intended for Easter trade were bought freely, and one mill making full fashioned all-silk for ladies had no difficulty in selling its production, being pressed for deliveries. The stockings from this mill are sold in retail stores at $3 a pair and up, for open work clocking. Another full fashioned mill has been operating but two-thirds of its equipment four days a week. A mill making seamless silks of standard types was operating at 55 per cent of capacity. Some of the seamless establishments have not been doing even so well and there are full fashioned mills which are in little better shape.

Novelties in hosiery have interferred with normal marketing of the staples. Many dealers hesitate to stock up with staples and are fearful of putting the novelties into their stocks lest the craze disappear as suddenly as it developed. Many of the smaller establishments will not handle the fine gauge stocking of four or five strand silk because it is so easily damaged at the counter and they are uncertain how much longer the demand for it will continue.

The stagnation in ladies silk stockings of the staple types may be said to be due in part to the popularity of hosiery of silk-and-wool in combination during the winter. The trade looks for a material picking up in April, with the laying aside of the silk-and-wool stockings. And yet, retailers are not inclined to take advantage of the ridiculously low prices at which silk hosiery is available for the brisker business to come.

Business in silk half hose has improved considerably, but continues spotty and prices are so low as to leave the inference there were excess supplies of some classes of silk socks. A few mills are selling their production at nearly adequate prices, and there is good sale for the well made split-sole types, selling to jobbers around $5.50 a dozen for the plain.

Big sellers in half hose lines are silk and fiber mixtures at prices around $3.50 a dozen. Higher grades are also moving freely. Fifty per cent mixtures, now offered at $3.75, compared with the previous price of $3.62½, are being accepted as fast as produced, some sellers state.

Women's fiber mixtures are being taken freely at unchanged prices, but advances are to be expected, in view of the upward tendency of raw silk, which is $2 to $2.50 a pound above the prices paid for present stocks, which necessarily are diminishing steadily.

Many of the jobbers who have been buying hosiery for the second quarter of the year also are buying wool goods in mixtures for fall, and some duplicate business has been placed. Low end cotton and mixture heathers are about the only types being bought. Grades better than 50 per cent wool and cotton, or selling at more than $6.50 a dozen are not attractive to jobbers, the bulk of the trading being in heathers around $3.25.

Infants socks, which for a number of months were scarcely moving, now are being bought in fair quantities by jobbers, some of whom have placed their second repeat order. Like many other lines of hosiery, the socks production was so rapidly expanded, and to such proportions, that the market could not absorb it. With accumulations of stocks, prices of a number of mills were reduced, and there had been no recovery from the low figures, notwithstanding radical advances in yarn since the opening prices were named. About the time staples in socks were being bought as additions to initial orders, a line of exclusive patterns was brought out by two mills and these promptly received a large share of attention.

The larger business in hosiery, relatively speaking, has come to mills selling direct to retailers, and some of these have had little difficulty in obtaining slight advances, hardly sufficient to take the hosiery out of its retail price range. Some of the direct-to-retailer mills have had an amazing increase in their business. They seem to have bought their yarns more advantageously than many of the mills distributing through jobbers. Possibly they received more encouragement from their customers than jobbers gave to manufacturers. One of the important direct-to-retailer mills came out about the middle of March with its samples for fall, prices being practically unchanged from those for deliveries for the summer season. This mill recently was confronted with the necessity of asking some of its customers to accept delayed deliveries, as there was a considerable volume of unfilled orders. Meanwhile many of the retailers were calling for advance deliveries and the mill had to discontinue accepting business for beyond May 1.

Notwithstanding advances in yarns, one of the larger mills selling to jobbers announces that its fall prices will be no higher than those which recently have prevailed. In this instance, however, there had been a substantial advance over the opening figures.

One might suppose, from the restricted way in which most jobbers and some retailers have been operating in hosiery, that there has developed a declining consumption. As a matter of fact, more hosiery was sold last year, according to production statistics, than in any previous year since the outbreak of the World War, and it looks as though sales will be even larger this year than in 1922. But much of the business has drifted away from jobbers and regularly established retailers. It has been taken over by a number of large concerns selling direct to consumer, and this class of establishments is increasing.

One of the older direct-to-retailer sellers claims that it has more than ten thousand men and women calling on consumers. Another, which is reputed to have had an enormous business last year, now is asking consumers to send for its representatives, who will show them thirty-five shades of ladies' silk hosiery, prepared to deliver any shade and any size promptly. A newcomer in the field of direct-to-consumer sellers is the United States Hosiery Co., Reading, Pa., for whom 4,000 shares of 8 per cent cumulative preferred stock is being issued. This company states that it manufactures no hosiery; that it buys from mills and therefore suffers no loss from depreciation and no embarrassment from strikes.

An important hosiery jobber was asked whether he thought jobbers and retailers were feeling the effect of sales to consumers through canvassers. "There is no doubt of it." he said. "While some interests who have made a study of the methods of canvassers and the disfavor in which they are held by many householders who have revolted against bell ringers, it appears to me that direct selling is in its infancy."

While the prices named by canvassers usually are no higher than those which are paid in retail stores for like

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goods, there have been so many instances of the taking down of exorbitant profits that a great part of the public believes retailers as a class are maintaining unnecessarily high prices. The point is made also as an outcome of the willingness of the public during the war period to pay almost any price asked, there has been an unwarranted increase in the number of retail stores, with a corresponding decrease in the business per retailer, and that therefore the cost of retailing in the regular way is so great that larger profits are necessary. Then, in favor of the canvasser is the effect of the personal touch, which in many stores is absent, so many of the persons employed to "wait on customers" lacking the tact of the successful salesman or a saleswoman.

Organized manufacturers and jobbers have been much agitated over methods of procedure for safeguarding the retailer by crowding out the canvasser. This will have to be done by the retailers themselves. They will have to carry stocks in order to afford that accommodation which the sharp is entitled to expect, and many of them should go back over their files of the newspapers for satisfying themselves that the war is over and that the public has changed its mind as to values as they were represented a few years ago.

In a retail store in New York not very long ago a line of underwear was placarded at $2.48 per garment. The mill price to the jobber was less than $11 a dozen. A southern manufacturer has in his wareroom a case of underwear which was returned by a retailer because of certain defects. In the case were a few garments bearing the retailer's price tag. He had marked them $2.50 per garment. The jobber paid the manufacturer less than $11.50 per dozen. In justice to the retail fraternity it may be said that identical garments, from the same mill, were on sale in a New York store on Broadway at 98 cents per garment, special. The manufacturer of the underwear which he sold at the price per dozen above stated, and which was sold in two retail stores at $2.48 and $2.50 respectively said, "I now understand why retailers complain that the public is objecting to prices."

Jobbers have had a very satisfactory business in underwear for spring and summer, and many of them have placed repeat orders at prices well above the opening. This is true especially of the better grades of men's bal briggans, of which it seems likely there will be a deficit before the consumer has completed his summer buying.

Mills which still are offering knitted underwear for spring are sitting tight on their prices and some are promising no deliveries inside of two months from date of order. A few lines which were withdrawn after selling at $3.50 per dozen were restored at $3.75. There developed very suddenly among retailers a tremendous appetite for light weight knitted underwear and requests for advance shipments are frequent. There has been a notable increase in the business in two piece garments, which is attributed mainly to the effect of widespread advertising of the knitted, the advertising campaign having been decided upon as a means of checking the inroads which were being made by nainsook athletic suits.

Retailers have done very little duplicate buying of heavy weight underwear for the current season, notwithstanding their initial orders are believed to have been not sufficient to carry them through the winter. It may be true, however, that the comparatively mild weather had the effect of lessening their sales of heavy weight, and it doubtless is true that a great part of the consumer public has abandoned heavy underwear entirely, and another part, instead of replenishing the wardrobe depleted of heavy weights late in the season, is stocking up with light weights for both tiding over and in preparation for the warmer seasons.

Trading in fall underwear, brisk for a time, now is necessarily in light volume. In the first place, a number of mills withdrew their lines after taking orders for consuming their yarn holdings, and may not restore them for another month or two, as there is a disposition to await developments in the cotton and yarn markets. Jobber repeat orders will not be received in worth while volume until after retailers begin buying more liberally. A great deal of heavy weight underwear was sold to jobbers for deliveries in January, February and March, at what now must be said to have been very low prices and much of this underwear has been sold to retailers, to be taken in during April and May. As to other lines, many of the retailers seem to be determined to defer their commitments until the trade has had a glimpse of the coming cotton crop statistics.

Ladies knitted underwear is promising of better results than for a time were looked for. There can be no denying the proposal that the popularity of flimsy silk garments of various descriptive terms curbed sales of ladies knitted underwear. But since raw silk has advanced to more than $9 a pound, with corresponding increases in the counter prices of the abbreviated garment which is worn underneath, there is evidence of a return to a more general use of the knitted cotton things, union suits and vests. The latter of the low end type are having a fairly good run.

Some of the more desirable types of sweaters for men and women have been bought freely by jobbers, late purchases being made at advances of about 10 per cent above the opening, which in its early stages did not augur well for mills and commission houses. Since the beginning of the year, however, jobbers have operated on practically a normal basis in popular lines and the extent of this business is reflected in shipments of worsted yarns. Knitted outer wear generally has started off well for next winter, but recently that which is embraced in the descriptive term fancy knit goods has been somewhat quiet. Business in bathing suits has slipped back slightly after a period of somewhat brisk buying, but dealers seem anxious to have their orders shipped out in advance of delivery dates specified.

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The Year Book of the National Association of Cost Accountants, containing a report of the discussions at the International Cost Conference held at Atlantic City last fall, has been issued and contains one section devoted to "Cost problems of the Textile Industry." This is a report of a special session of the conference dealing with the textile industry, and the speakers included men highly qualified to bring out the most important aspects of cost accounting in the textile industry and to bring light to bear upon the problems confronting the textile manufacturers. The speakers whose addresses are reported include: Eugene Szepesi, E. G. Boutelle, C. W. Bennett, and John Nash McCullough, secretary of the National Association of Hosiery & Underwear Manufacturers.

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The pathway to a better job is generally sprinkled with perspiration.

# The Yarn Market

Irregularity in prices, though on a higher plane, not much in the way of healthy demand, with selling factors sitting firm, marked the Philadelphia cotton yarn market for the past month.

The unusual spurts and jumps in raw cotton had their inevitable effect on yarn prices, and caught them out of the mouth of a place in the lower regions, and dragged them perforce of the staple's own strength up to a higher ground. Cotton passed twenty-five cents—vigorously declared impossible by some until it happened—then it played havoc with their estimating opinion when it slid to the top side of thirty cents. It was natural that such a strengthening of rates in the raw staple market should affect yarns, and it did, although the result seems to indicate that the increase was not proportionate inasmuch as yarns seemed to lag a few points under the relatively increased strength of cotton.

Quotations were lifted approximately a nickle on these coarse and medium numbers of carded yarns, with the finer qualities of peeler combed products showing less recovery.

Demand continued sluggish and spotty. Spinners remained firm in their demands for "a price to cover cost," and seemed to be just above the rates generally being offered. However, while taken on the whole, evidently, a relatively small amount of yarn changed hands through this market, at the same time some good business was done. Carded yarns and the coarser underwear yarns figured for a good bit of the business, reflecting, it was pointed out, increased activity and better feeling on the part of the consumers of these types, or a better business from the delivery end of the consumer's own plant.

Combed material continued slow and indicated strength not equal to that of the carded sections.

Some business was done, it was pointed out. However, this was not general, and those making the sales apparently made the proposition attractive to the purchaser, and the business that was done resulted from honest-to-goodness canvassing.

The following paragraph, taken from a recent bulletin of the National Association of Hosiery and Underwear Manufacturers, refers to irregularity of price quotations:

"Just as the socialistically inclined tell us that there is one law for the rich and one for the poor, it would seem that there is one price for the small and one for the large manufacturer when it comes to buying yarns. While it is an accepted axiom of modern business that volume buying is entitled to price preference, when a comparatively large operator can buy yarns as much as five cents per pound less than his smaller competitor can buy the same yarn in smaller volume, who is to determine what the market price of that particular grade of yarn is? This query is prompted by the consistent cavilling on the part of sellers and large consumers at printed quotations on yarns. The seller maintains the quotations are too low and the big consumer says they are too high."

The rates published are as accurately determined as possible in a market where, in individual instances, quotations and sale prices are mobile and are adjusted to meet the particular case at the particular time, governed by the particular conditions existing.

Following are quotations published on the Philadelphia market on March 14:

**Single Skeins.**

| | | | |
|---|---|---|---|
| 4s to 8s | 46 | 20s | 52½ |
| 10s | 47 | 24s | 54½ |
| 12s | 47½ | 26s | 58½ |
| 14s | 48 | 30s | 59½ @60 |
| 16s | 49 | | |

**Single Warps.**

| | | | |
|---|---|---|---|
| 8s | 47½ | 20s | 54 |
| 10s | 48½ | 26s | 60 |
| 12s | 49½ @50 | 30s | 61 @62 |
| 14s | 51 | 40s | 70 @71 |
| 16s | 51½ | | |

**Carpet and Upholstery Yarn in Skeins.**

| | |
|---|---|
| 8s and 9s 3-4 slack | 46 |
| 8 3-4 tinged tubes | 44 |
| 8 3-4 hard white warp twist | 42 |
| 8 3-4 hard twist waste | 44 |

**Two-Ply Skeins.**

| | | | |
|---|---|---|---|
| 8s | 48 | 20s | 54 @55 |
| 10s | 48½ | 24s | 59 @60 |
| 12s | 49 | 26s | 61 @62 |
| 14s | 50 | 30s | 63 @64 |
| 16s | 52 | 40s | 73 |

**Two-Ply Warps.**

| | | | |
|---|---|---|---|
| 8s | 49 | 20s | 54 @55 |
| 10s | 49½ | 24s | 60½ |
| 12s | 50 | 26s | 62 @63 |
| 14s | 51 | 30s | 64 @65 |
| 16s | 52 @53 | 40s | 73½ @74 |

**Frame Spun Yarn on Cones.**

| | | | |
|---|---|---|---|
| 8s | 45½ | 20s | 50 |
| 10s | 46 | 22s | 51 @52 |
| 12s | 46½ | 24s | 52 @53 |
| 14s | 47 | 26s | 54 @55 |
| 16s | 48 | 30s | 58 |
| 18s | 49 | 40s | 70 |
| 30s double carded | | | 58½ @59½ |
| 30s tying-in | | | 54 @55 |

**Two-Ply Combed Peeler Skeins and Warps.**

| | | | |
|---|---|---|---|
| 8s to 16 | 60 | 50s | 88 @90 |
| 20s | 62 | 60s | 96 @$1.00 |
| 24s | 65 | 70s | $1.07@$1.15 |
| 30s | 70 | 80s | $1.28@$1.30 |
| 40s | 78 | | |

**Mule Spun Carded Yarn on Cones.**

| | | | |
|---|---|---|---|
| 10s | 45 | 20s | 50 |
| 12s | 46 | 24s | 52 |
| 14s | 47 | 26s | 53 |
| 16s | 48 | 30s | 59 |
| 18s | 49 | 40s | 71 |

**Mule Spun Combed Peeler Yarn on Cones.**

| | | | |
|---|---|---|---|
| 10s | 53 | 26s | 68 |
| 12s | 54 | 28s | 72 |
| 14s | 55 | 30s | 75 |
| 16s | 57 | 36s | 79 @81 |
| 18s | 58 | 38s | 83 |
| 20s | 60 | 40s | 85 @90 |
| 22s | 63 | | |

## The Problem of Afternoon Fatigue.

Office managers, manufacturers, practically all employers of labor, realize that fresh air is a dominating factor in the efficiency of their workers. As a result afternoon fatigue and listlessness of these employees are quite correctly attributed to bad air conditions.

Open windows do not solve the problem because the workers are then exposed to drafts and sickness.

Ventilating engineers have made it possible to keep office atmosphere fresh and invigorating throughout the year by the simple installation of ventilating fans, which may be obtained from electrical dealers everywhere. Offices may be filled with fresh and invigorating outdoor air, and the poisonous, stagnant air quickly removed. These American Blower ventilating fan installations are not expensive. In fact, the price is negligible compared with the benefits.

Cama, Norton & Company, importers of electrical machinery, plants, devices and appliances, 11, Elphinstone Circle, Bombay, India, advise they are interested in receiving catalogs and other information regarding products of American manufacturers of electrical and other equipment of an allied nature.

# Elements of Permanency and Fire-Safeness May Decide Success or Failure of Cotton Mill

BY W. B. ELCOCK, PORTLAND CEMENT ASSOCIATION, ATLANTA, GA.

The elements of success in industrial undertaking often are the invisible ones. Two companies may do identically the same gross business with failure for one and success for the other as a result. Usually the successful enterprise is the one with up-to-date labor and time saving equipment and facilities. Facilities that require constant repair and maintenance charges cut net earnings. These deductions, decisively apparent after years of operation, often are neglected or put aside at the time of construction. Inevitably, however, they must be met and with other, even less apparent, but none the less vital factors, may bring failure.

The solution of all business problems would be very simple if it were possible to express every factor in terms of dollars and cents. This is of course the only correct basis for decision but some things of vital importance are difficult to translate in money values.

Thus, the influence of comfortable quarters on the productive capacity of employes, the psychological attitude of the employe toward the employer, the lighting of the building in which the industry is housed, the protection which it affords against deterioration of finished product, the influence on manufacturing operations and the movement in and out of manufactured goods as affected by the type of construction of the building and facilities—all are difficult of expression in dollars and cents. But proof that these factors are of vital importance may be deduced from the fact that almost without exception companies which enjoy prosperity are those which have provided facilities in the way of proper buildings and means of ingress and egress for manufactured articles, which contribute to high speed and low cost production.

Interior View in Riverside Plant. Concrete Floor Affords Perfect Base for Heavy Machinery.

The manufacturer who limps along with antiquated machinery will be outstripped in the competition for market. He may understand the necessity of being on a par with his competitor insofar as productive capacity is concerned. He does not, however, always have a full appreciation of the effect of obsolete machines on capacity and the choke on employes created by ill-lighted, cramped and probably dangerous buildings.

Engineers, consider the routing of materials through a mill one of the important factors for efficient production. If the plant buildings are so arranged that routing cannot be established to cut lost motion, the advantage of labor saving and up-to-date machinery will be lost. Many textile manufacturers are still trying to get along with old buildings which served their purpose at the time of their construction but which do not permit of the use of the most modern machinery and processes essential to maximum economy in the finished product.

Detail of Water Front Side of Riverside and Dan River Cotton Mills, Danville, Va., Showing Fire-safe and Sanitary Construction.

In the early days of cotton manufacture, the source of power governed the location of the mill. Textile machines were comparatively small. High ceilings were not necessary, nor was great strength required in the floors. Vibration was not a serious consideration. With the improvements in textile machines, they were built heavier and tuned to higher speeds. Buildings in which these machines are housed now require loftier story heights, larger window areas, and must be a type of construction which will resist vibration and permit the machines to be run at maximum speed whether on the first floor or on the seventh.

The old time mills did not perform anything like the number of operations required for the finished product of today. Hence the value of these plants bears little relation to the value of the complete mill of the present. Modern textile mills contain machinery of much value and often embrace a number of buildings some of which are used for warehouse purposes. The destruction of such a plant by fire entails a loss so great that no item of protection against fire can be neglected. Protection against such loss does not stop with provision of fire fighting apparatus and cautionary reminders to employes.

The only real protection against fire is a type of con-

struction which not only won't burn but which protects the contents against the certainty of total loss. Thoroughly firesafe buildings, provided with fireproof cut-off walls, protected elevator shafts, etc., eliminate the chance that the textile industry will lose a large and important unit and its contents. The Salem, Mass., conflagration in 1914 demonstrated to the textide industry what the protection afforded by a concrete building meant. In the main conflagration area, the only building left intact was a concrete storehouse of the Naumkeag Steam Cotton Co. This building was of reinforced concrete throughout—walls, floor and roof. Since that time the use of reinforced concrete for textile mill buildings has increased by leaps and bounds until a vast majority of the largest and most up-to-date mills are of this type.

The Cotton Mills at Winnsboro, South Carolina, are Models of all that a Modern Textile Plant Should Be. Reinforced Concrete Construction Makes Them Good Investments.

The first cost of the concrete building as compared with its competitor—the slow burning mill construction, shows little advantage either way. "There is very little difference between the cost of the concrete building and a timber structure with brick walls," says Lockwood, Greene & Co., in the "Builders" for April, 1922. In fact, it is almost impossible to estimate the difference in cost without taking off actual quantities.

The cotton industry is worthy of the best type of buildings. The inflammability of the occupancy whether for manufacturing or warehouse purposes is so great that no chances can be taken. The likelihood that the mass of the structure itself will contribute to the total destruction of both building and contents must be considered. If, therefore, brick bearing walls, with heavy wooden columns, wooden girders and wooden floors cost but little, if any, less than a reinforced concrete construction, the manufacturer and warehouse man should not hestitate about the type of his structure. Concrete protects not only the business itself, but the public in general from loss, whether through fire or because of financial failure arising from the invisible factors of lost efficiency which work slowly, but certainly against the non-progressive mill.

Editor's Note—Cotton will be pleased to receive inquiries regarding concrete construction practices from any interested persons. Send in your problem no matter how difficult it may be. Wherever deemed necessary questions will be forwarded to recognized authorities for personal attention. This service is free to all who care to take advantage of it.

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SIMULTANEOUSLY dyes to shade, eliminating all specks, motes, leaf and shives in ONE operation of THREE hours time. It is particularly adapted to dyeing light and bright shades without previous bleaching.
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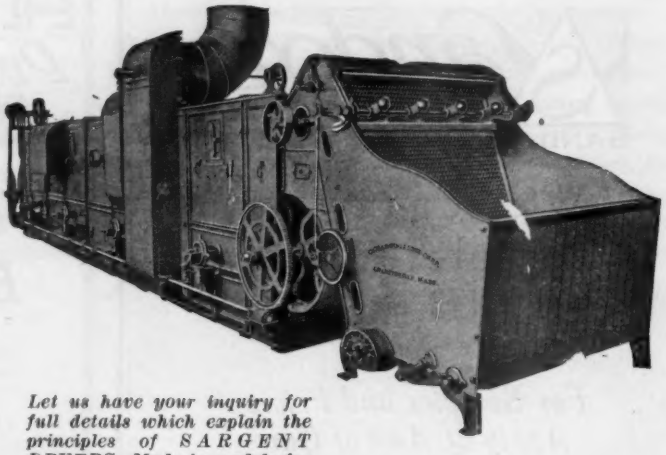

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Of all coarse aggregates none tests so high in tensile and compression strength as crushed and screened Basic Slag. The wide use of Basic Slag in reinforced concrete construction evidences the appreciation of this fact by leading architects.

*Slag Concrete is practically Everlasting!*

And the reason is that this scientifically prepared product, on account of its marked strength and angularity, forms a tighter bond when mixed with cement. A bond that grows stronger as it grows older. That is why structures of Slag Concrete are practically everlasting.

**Birmingham Slag Company**
*Slag Headquarters for the South*
ATLANTA BIRMINGHAM THOMASVILLE

# Does this ocean-river-rail storage development interest you?

## *Get your bid in before April 20th.*

THE location of this Quartermaster Depot, about nine miles from the center of Charleston, was selected by the War Department after careful consideration of several sites along the South-Atlantic seaboard.

The reasons for this selection were primarily the harbor capacity with coaling and railroad facilities available. The Government's extensive improvements have greatly enhanced the advantages of this storage and shipping base for industrial and mercantile purposes.

The Depot will be sold by sealed bid on April 20th—in its entirety.

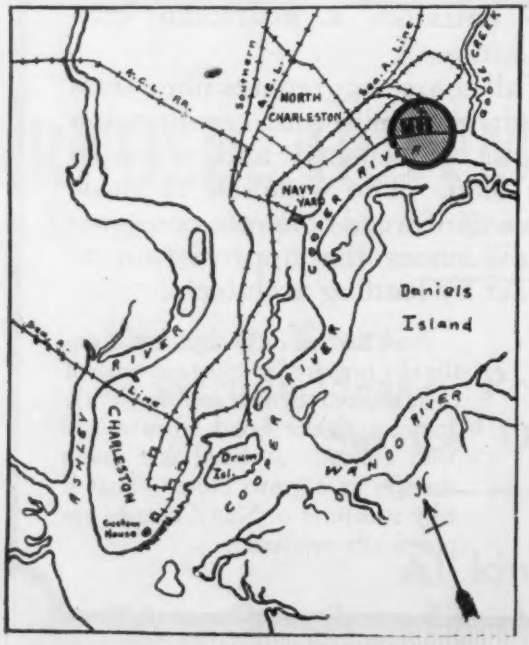
It comprises approximately 600 acres of improved land with the following facilities and buildings:

Railroad yards with a capacity of about 900 cars, and, in addition, several miles of laid track serving the warehouses and dock.

Six warehouses, each 160 x 1,200 feet, a total of over one million square feet of storage space.

One Headhouse, 150 x 1,360 feet, situated between the ends of warehouses and dock.

Dock, over 2,000 feet long.




**COTTON**
**TOBACCO**
**METALS**
**NITRATES**
**TEXTILES**
**MACHINERY**
**OIL**
**RAILWAY**
**CONTRACTING**
**REFRIGERATION**
**MARINE**
**CHEMICAL**

Miscellaneous Barracks, Quarters, Mess Halls, Sheds, etc.

Fire Station and Equipment.

One Steel Water Tank, 200,000 gallon capacity, situated near warehouses.

One Pumping Station, and four Wooden Storage Water Tanks, 200,000 gallon capacity each.

For specifications, terms of sale and proposal blanks write the Quartermaster General, Room 2024, Munitions Building, Washington, D. C., the Quartermaster, Intermediate Depot, Charleston, S. C., or the Chief of Sales Promotion Section, Room 2515 Munitions Building, Washington, D. C.

The Government reserves the right to reject any or all bids.

# WAR DEPARTMENT

# Won't Chip, Crack, Peel or Turn Yellow

TIME works slowly in contact with Wahcolite. The years cannot make it chip, crack or peel; it does not turn yellow with age, but retains its brilliant whiteness.

These are the reasons why Wahcolite is known as the longest-wearing mill white made. Why executives who figure costs closely find Wahcolite cheapest over a period of time.

Wahcolite is also the brightest mill white made. Tests have proved its refractive powers to be greater. Wahcolite not only magnifies the power of daylight, but it keeps your workrooms light more hours per day.

Wahcolite is washable with soap and water. It is the perfect white finish for walls and ceilings of mills, factories and warehouses. More than eighty years of experience guarantee its superiority. Get complete information about this master mill white. Write for booklet, "Keeping in the Spotlight." It will be sent free on request.

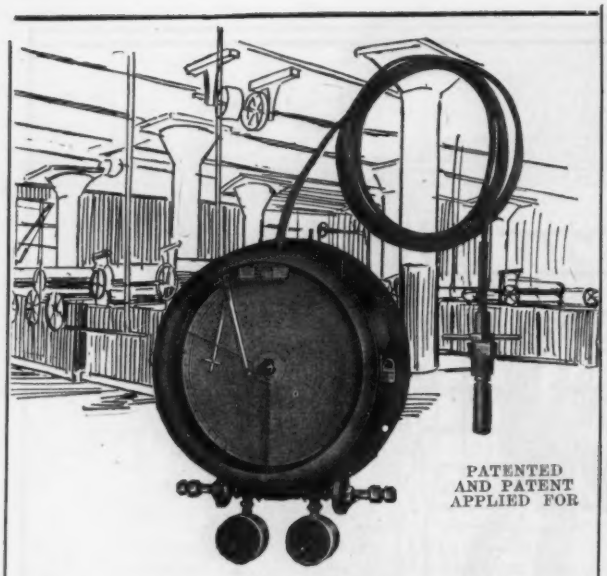
### *On the Outside*

Buildings of brick, cement and stucco are made truly beautiful with Bay State Brick and Cement Coating. It waterproofs them, too! The hardest rain cannot beat through a coating of Bay State. Write for booklet No. 12, on Bay State Brick and Cement Coating.

THE BAY STATER

WADSWORTH, HOWLAND & CO., Inc., BOSTON

# "WAHCOLITE"



PATENTED AND PATENT APPLIED FOR

# Your Greatest Possibilities for Saving

More accurate control of sizing, dyeing and finishing processes offers you the greatest possibilities for saving steam, labor, time and materials.

Accurate control of these processes is possible with a Foxboro Temperature Recorder-Controller—the only instrument of its kind. It enables you to standardize the operation of your size boxes, dye machines, hot water tanks, carbonizers, drying machines and similar equipment.

It combines our temperature controller and recording thermometer, both of which have been widely and successfully used for years. The use of one bulb to actuate both recorder and controller gives an accurate record of controller operation. The permanent records obtained are invaluable in developing and standardizing processes.

Let our engineers show you where you can make worth-while savings by installing the Foxboro Recorder-Controller. "The Compass of Industry." Write to Dept. AS.

**THE FOXBORO CO., Inc.**

FOXBORO, MASS., U. S. A.

New York Chicago Boston Tulsa Cleveland
Pittsburgh Philadelphia San Francisco Birmingham

**FOXBORO**

TRADE MARK

*THE COMPASS OF INDUSTRY*

4855

# "DEVELOPENE"

**Leaves No Argument as to When**

**"BLACK IS BLACK"**

**WHY BE SATISFIED**

with a RUSTY BLACK when you can have a RICH LUSTROUS BLACK by finishing your Hosiery with the latest, most efficient and satisfying patented preparation.

**"DEVELOPENE"**

**A Demonstration Will Convince You**

Send us a pair of unfinished stockings, skein of yarn or a piece of fabric—cotton, silk, artificial silk, wool or mixes—which has been dyed black, washed, but not finished. We will finish it with "DEVELOPENE" and return to you.

There will be such an improvement that you will immediately want "DEVELOPENE" for finishing your goods.

No further softener—or soap—required. Makes hosiery slip on and off the board easily—leaves the product soft and pliable.

# Kali Manufacturing Company

**Manufacturing Chemists**

**1404-10 No. Front St. Philadelphia, Pa.**

*Sole Manufacturers of*

**Hydroxy Oil and Kali Chlorine Neutralizer**

## *"A Wonderful Machine"* is the way one user describes his

# FLETCHER ELECTRIC UNDERDRIVEN EXTRACTOR

And he adds:

"I could not help but recommend this machine to a brother of mine if he were in need of an extractor. In fact, we cannot find one thing to criticize on the machine."

**You owe it to yourself to know more about this modern extractor.**

**Write for Bulletin 11 C**

**FLETCHER WORKS**

Formerly SCHAUM & UHLINGER
**Glenwood Avenue at Second Street**
**PHILADELPHIA, U. S. A.**

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The Grasselli CHEMICAL CO.
GRASSELLI CHEMICALS DEPT. INC. EXPLOSIVES DYESTUFFS
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**ESSEX ANILINE WORKS, INC.**
**Boston, Mass.**

**KATIGEN RED BROWN 9 R N**
**Our new Sulphur Color of equal fastness and alike in dyeing properties to the pre-war color of the same name.**

**Katigen Red Brown 9 R N is redder and brighter than any Sulphur Red Brown made in this country at the present time.**

**KATIGEN YELLOW BROWN 2RN EXTRA. A lively shade of Brown for cotton hosiery, yarns and raw stock. Of special importance for the production of tan and cordovan shades.**

We also offer a full line of Algol and Developed Colors manufactured by
FARBENFABRIKEN VORM. FRIED. BAYER & CO.
Leverkusen

***Product samples and quotations submitted upon request.***

# Rohm & Haas Company Inc.

Manufacturers of

## CHEMICALS

PHILADELPHIA, PA. BRISTOL, PA.

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## SODIUM HYDROSULPHITE—

Sulphoxylates and Allied Products.

LYKOPON—Sodium Hydrosulphite—
For reducing Indigo and vat dyes. Of highest quality and absolutely standard.

FORMOPON—For discharging.

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Represented by

## The MAKENWORTH COMPANY

Greensboro, North Carolina

# Chas. Lennig & Company

Incorporated

40 North Front Street Philadelphia, Pa.
Works: Bridesburg, Philadelphia, Pa.

Manufacturers of

## Concentrated Sodium Sulphide

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Also manufacturers of the following chemicals:

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| ALUM | GLAUBER SALT |
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Represented by

## The MAKENWORTH COMPANY

Greensboro, North Carolina

DURABLE K-W UNIVERSALLY USED

# KLAUDER - WELDON
## DYEING - BLEACHING-SCOURING MACHINERY

There are K-W machines in use which were built nearly half a century ago and which are still doing their work efficiently and economically under severe service. This is sufficient evidence of the durability and capability of K-W machines after long years of subjection to the ravages of live steam, heat and alkalis.

K-W Machinery, by its accomplishments, has steadily and irresistibly built up a reputation that has made the name "Klauder-Weldon" synonymous with the "world's best dyeing, bleaching and finishing machinery."

Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

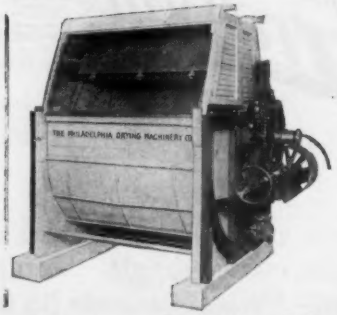
*Write today for K-W Literature*

## THE KLAUDER-WELDON DYEING MACHINE CO.

Bethayres, Pa., U. S. A.

H. G. Mayer, Southern Agent,
Realty Bldg., Charlotte, N. C.

# "HURRICANE"



## Rotary Hosiery Dyeing Machines

If you dye or bleach hosiery it will pay you to investigate the many advantages of our latest type machine.

It is suitable for dyeing or bleaching cotton, mercerized, silk and artificial silk hosiery.

The tub is lined with monel and the pockets of the cylinder, which are also monel, are so constructed as to eliminate the use of dye nets, and will not tangle the goods.

Standard size machines—100 to 300 pounds.

See our display at Knitting Arts Exposition, Booths 249-250-251

## The Philadelphia Drying Machinery Co.

Office and works: 3351 Stokely St. Philadelphia, Pa. Boston Agency: 53 State St.

## Rodney Hunt Equipment

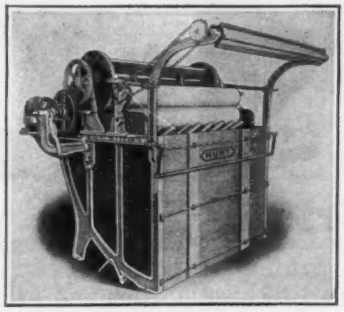
**Will Solve**

**Your Wet Finishing Problem**

Bleach

Dye

Wash



All Cotton Fabrics Woven or Knitted

MOTOR DRIVEN REEL MACHINE
(Ask for Booklet 1119)

**RODNEY HUNT MACHINE CO.**

47 MILL ST., ORANGE, MASS.

District Representatives
Philadelphia, Pa.; Chicago, Ill.; Charlotte, N. C.;
Hamilton, Ont., Can.

## "BRETON" MINEROL "F"

*For Plushes and Velvets*

*"It gives a silky lustre"*

**BORNE, SCRYMSER CO.**

*Established 1874*

**80 South Street, NEW YORK**

BOSTON PHILADELPHIA

Works: Elizabethport, N. J.

## FILTERS

**PRESSURE GRAVITY**

Especially designed to meet all requirements of Textile Mills.

Economical in upkeep.

Perfect satisfaction.

**NORWOOD ENGINEERING CO.**

**Florence Mass., U. S. A.**

CHAS. M. SETZER, Southern Representative,

Charlotte, N. C.

## Safety, Too

Your floors are in one of two conditions; either they are safe under foot or they are a constant menace to the life and limbs of your employees.

This latter condition is not caused by failure to wash the floors, but rather through the use of soap powders which fail to rinse away the greasy, soapy film which they deposit during the washing process.

These dangerous factors never result when

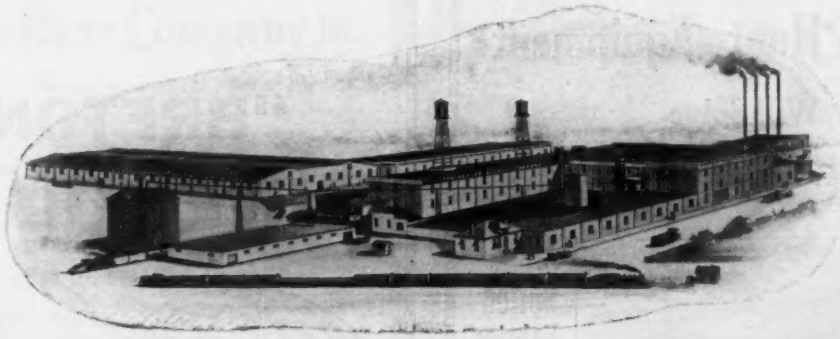
**WYANDOTTE DETERGENT**

is used, for in hundreds of mills where this cleaner is standardized the floors are not only cleaned and cleaned easily and economically, but also so freely does Wyandotte Detergent rinse that the surface is left with a perfectly firm, safe foothold for the active, busy worker.

*Ask your supply man.*

**The J. B. FORD CO., Sole Mnfrs.**

WYANDOTTE, MICHIGAN



# VICTOR MILL STARCH

## The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

**THE KEEVER STARCH COMPANY, Columbus, Ohio**

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

**JACQUES WOLF & CO.**

**PASSAIC, N. J.**

Manufacturers of
Chemical Specialties for the
Textile Mills

ALIZARINE ASSISTANTS

CREAM SOFTENERS

HYDROSULPHITE

MONOPOLE OIL
Reg. Trade Mark
No. 70991

GUMS
Arabic, Karaya, Tragacanth

**Uniform in Application**

**VICTROLYN**

Penetrating, Lubricating, Dependable
Assistant in Warp Sizing

**KLORASENE**

will remove Oil Stains.

If you are troubled, write us.

**BOSSON & LANE**

Manufacturing Chemists

ATLANTIC, . MASS.

# Roller Cloth

Our Roller cloths are made of the right material with exactly the correct cushion and uniformity of surface to produce the most desirable results.

# Clearer Cloth

Clearer Cloth is constructed of high grade material with thick, strong nap that does not pull out and its uniform length is such that the rolls are completely cleared of all short fibre.

# Slasher Cloth

Our Slasher Cloth is made of the best material of sufficient cushion and porous to thoroughly force the sizing into the yarn.

**PHILADELPHIA FELT COMPANY**

**FRANKFORD, PHILADELPHIA, PA.**

**Southern Sales Agent: M. C. Sanders, Greenville, S. C.**

# Staley's Starch

**Staley service guarantees superior quality in textile products—at lowest cost.**

**This is because our starches are specially processed to specific requirements, with our full co-operation for best results.**

**The successful application of this service has made Staley's mill starches the standard of the textile industry.**

**Consult our technical and engineering staff, without obligation.**

**A. E. STALEY MFG. CO.**
**DECATUR, ILLINOIS**

*508 Andrews Law Building, Spartanburg, S. C.* — *J. W. Pope, Ansley Hotel, Atlanta, Ga.*

*25 Church Street, New York City* — *83 Broad Street, Boston, Mass.*

# SATISFACTION

in knowing what you have is **the best** is one of the reasons why

# SAVOGRAN

is specified in Cotton Mills, both North and South, when a thoroughly efficient cleaning material is required.

"ASK YOUR SUPPLY HOUSE"

Manufactured by

**INDIA ALKALI WORKS**

**Boston, Mass.**

# Both Spell Economy

**This is No. 20 Re-Fil-It Floor Brush**

Fillers for all conditions can be used in this Re-Fil-It brush-hair combinations, broom corn, bass, etc. For Spinning Rooms this brush with short corn filler is ideal.

**This is No. 3 Re-Fil-It Broom**

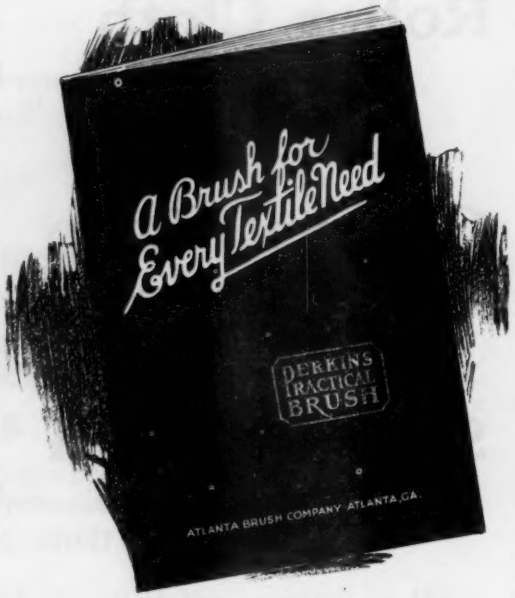
Equal in bulk, but superior in service and economy to a No. 8 stitched broom. It is designed for general sweeping.

*Write us for prices and particulars.*

**RE-FIL-IT BROOM MFG. CO.**

**185 Devonshire St., Boston**






# *At Your Service*

A catalog containing pen drawn illustrations of all the Textile Brushes manufactured in this plant has come from the press, and is now ready for distribution to executives, superintendents and others who may be interested.

It is a complete book, for it embraces all the brushes used in textile mills—a varied assortment, to be sure.

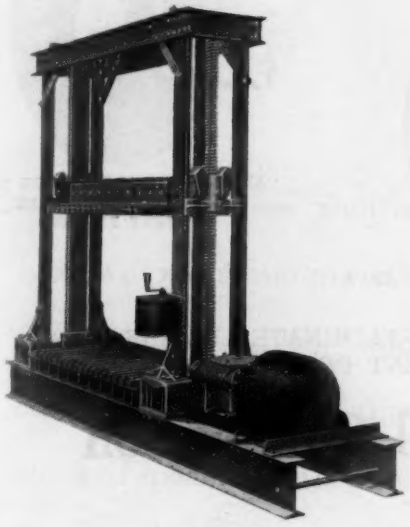
And, best of all, each brush is for a specific use, made in accordance with the demands of those who have learned from experience.

The book is yours for the asking.

**Atlanta Brush Company**
**Atlanta, Ga.**

Another

# REX PRESS



New Cloth Press

## Speed, Strength, Simplicity

**Built any size and pressure.**

**The Rex Creed**

To build a press so good that the simple truth about it will be adequate recommendation and to price it so fairly that its value can never be questioned.

**Watch for the Yarn Press.**

## REX ENGINEERING CORPORATION

**Dunkirk, N. Y.**

**J. S. HULME**
**Southern Representative**
**Atlanta Trust Co., Bldg.**
**ATLANTA, GA.**

# American Thread Co.
## Uses Electric Scrubbing

Besides this great company, three hundred other great textile mills will tell you that the FINNELL SYSTEM of *Electric Scrubbing* pays big dividends.

As a labor saver alone, this system actually pays for itself in a few months. Added to this are many equally important benefits: (1) better working conditions; (2) cleaner production; (3) less waste and soilage; (4) *fewer accidents;* (5) healthier and happier employees; and (6) better light and air.

No. 5 SCRUBBER

# FINNELL SYSTEM
## OF ELECTRIC SCRUBBING

gets absolutely clean floors and keeps them clean at a modest cost—something hand scrubbing and mopping has never done.

Any mill can make it pay. Size makes no difference. Small mills need less equipment, but results are just as profitable in proportion.

The Finnell Scrubber—in several sizes—applies a pressure equal to twenty-five scrubwomen, covers space three times as fast, and is easily operated by one man.

The Finnell Water Absorber picks up dirty suds, leaving floor dry and clean. The Finnell Mop Truck makes mopping, where necessary, easy, economical and clean. No pail carrying—no "dirty" mopping.

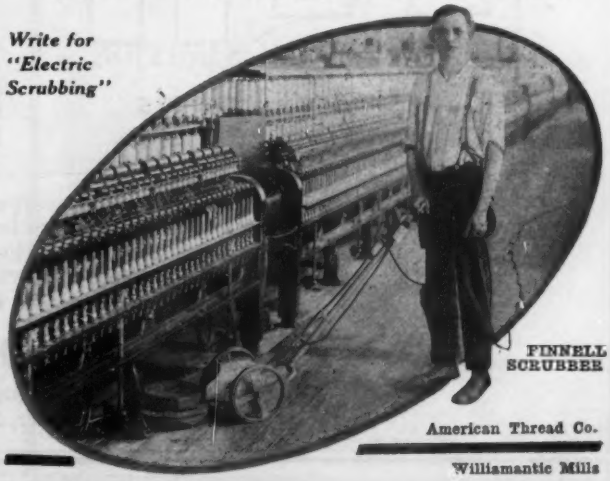
FINNELL MOP TRUCK

Write today for complete information. State amount of floor space you use.

**American Scrubbing Equipment Sales Company**
**54 N. Collier Street, Hannibal, Mo.**

*"Clean Floors Reflect Clean Business"*

*Write for "Electric Scrubbing"*



FINNELL SCRUBBER

American Thread Co.

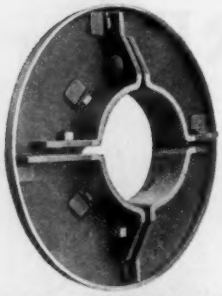
Williamantic Mills

# All Steel Loom and Section Beam Heads

## Cannot Break
## Do not Bend

"ALL STEEL" LOOM BEAM HEAD
"MALLEABLE" GEAR
Patent Pending

"ALL STEEL" SECTION BEAM HEAD
PATENTED



"ALL STEEL" ADJUSTABLE HEAD
SPLIT OR SOLID TYPE
PATENT PENDING

DUPLICATE YOUR CAST IRON HEAD IN STEEL — ELIMINATE ALL BREAKAGE
MAKE YOUR BEAM HEAD INVESTMENT PERMANENT

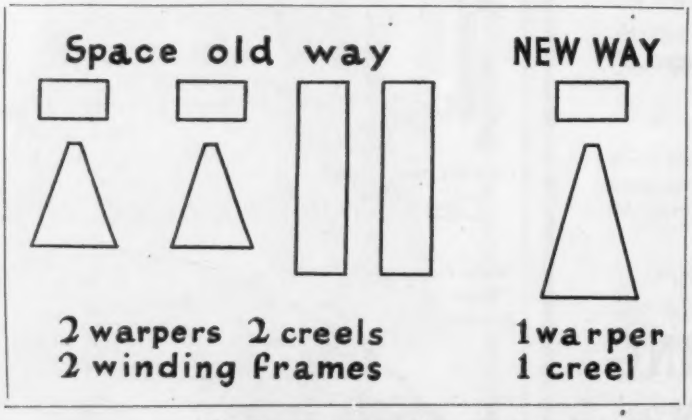
## Mossberg Pressed Steel Corporation

**Attleboro, Mass.**

SOUTHERN OFFICE 201 AUGUSTA ST. GREENVILLE, S. C.

# NEW AUTOMATIC CREEL

**for direct warping from FILLING WOUND BOBBINS**




COMPLETELY ELIMINATES the

Spooling of the yarn

Spooling waste

Undue and irregular tension of yarn due to spooling

Stoppage for doffing

Doffing is done while warper is running.
Greater production from better warps at lower cost.
Better loomage from auto-creel warps because
**Elasticity is preserved in yarn.**

*For Information address*

## AUTO CREEL CORPORATION, NEW YORK

Room 915, Fifth Ave. Building
Alfred Suter, Sales Manager

# MATERIAL

## *Factor No. 3*

Over one million shuttle blocks of mountain-growth Dogwood, air-dyed, and carefully inspected. A large stock of special steel, brass, linseed oil and all other materials necessary for the manufacture of perfect shuttles, also on hand.

Here is the third of the four factors that assure

**Prompt Delivery**

**to the Users of Shambow Shuttles**

4 FACTORS
Men
Money
Material
Machinery

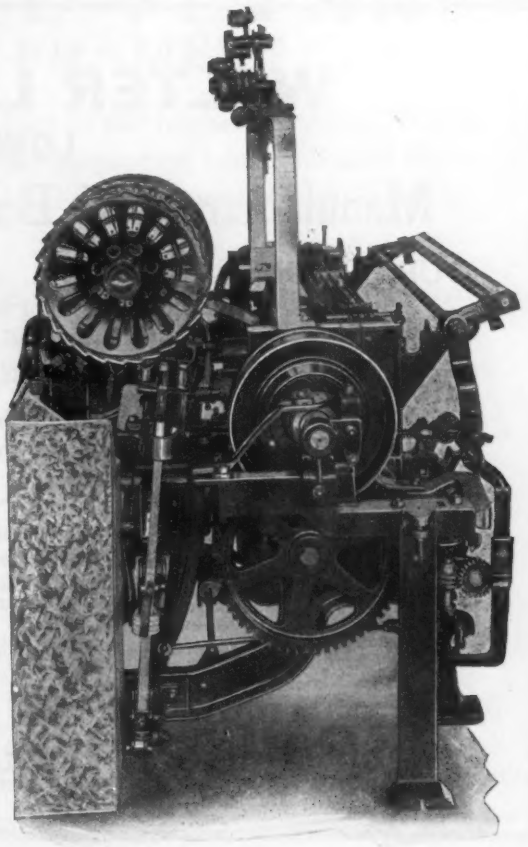
HEART OF THE LOOM

**Shambow Shuttle Co.**

JOHN C. SHAMBOW, Pres. & Treas. H. H. ULLMAN, V. Pres. & Gen. Mgr.

8 Winter St., Woonsocket, R. I.

Philadelphia, 421 Bulletin Bldg. Paterson, N. J., 245 Straight St. Greenville, S. C., Southern Factory



## The Latest
# NORDRAY
## Automatic Loom

Multiple-harnesss, Feeler type

built by

**HOPEDALE MANUFACTURING CO.**

at MILFORD, MASS.

SOUTHERN OFFICE at GREENVILLE, S. C.

This loom was shown at the Late Greenville Exposition and excited great interest.

***It is Still the Simplest.***

# WALTER L. PARKER CO.

**LOWELL, MASS.**

## Manufacturers of Bobbins, Spools and Skewers

**OUR SPOOLS:—**

Are made to stand severe service and are made from thoroughly dried stock, so constructed that they are giving entire satisfaction.

**OUR BOBBINS:—**

Are made from the best grade of stock, and through the efficiency of our workmanship, are true running, and properly fitted on spindles.

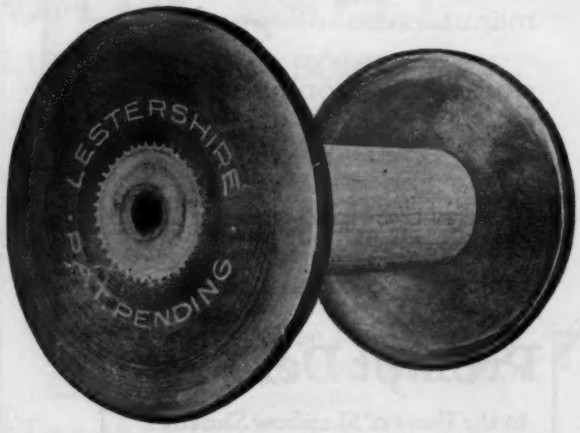
**OUR PRODUCTS:—**

**Bobbins**—Warp and Filling. We put on all kinds of metal shields and caps.
**Speeders**—Plain; steel rings; metal base.
**Spools**—Warper; Twister.
Our Metal Bound Spools are pronounced the best on the market.
**Skewers**—Cop, Warper and Roving, of all descriptions.
**Twisters**—Universal Winder Rolls and Bobbins, Comber Rolls, etc.

***We Specialize in New Mill Equipment***

**CHARLOTTE SUPPLY CO., SOUTHERN AGENTS.**

# What Part of the Spool is First to Wear Out?




Your superintendent will confirm our statement that 99% of all Warper, Twister or Spooler Spools become useless on account of the heads breaking, wearing rough or loosening. This is true of all types of Spools heretofore on the market.

With the Lestershire Type Vulcanized Fibre Head Spools just the opposite is true. The Heads will outwear the barrels because Hard Vulcanized Fibre (the same material from which end thrust bearings and automobile gears are made) will never break, wear rough nor splinter.

Of course the first cost is higher but, figuring your charges per thousand spools per year, they are by far the most economical spools on the market today.

In addition Lestershire Fibre Head Spools will in the ordinary mill give you an increased unloading production of nearly 50%. Put a row on your creel and compare the time necessary to unload with any other type Spool.

On the smooth Rock Maple barrel, cleanly jointed to the Fibre Heads which cannot get rough and cannot be dented, there is no place for the yarn to catch.

Spindle wear is also eliminated by bushings of hard well seasoned Dogwood.

Increased traverse can be had which will give you greater yardage on your spools. This means a saving of many dollars in the course of a year, not only direct but in labor required to change the spools.

At your request we will gladly send samples for purposes of test and comparison.

**LESTERSHIRE SPOOL & MFG. CO.**

***Manufacturers Mill Spools, and Bobbins, of Every Description***

**JOHNSON CITY, N. Y.**

# SACO-LOWELL FLYERS
## FOR ROVING FRAMES

A finished product of the highest quality. Made in our own shops by improved methods and tools. Thoroughly dependable and unconditionally guaranteed.

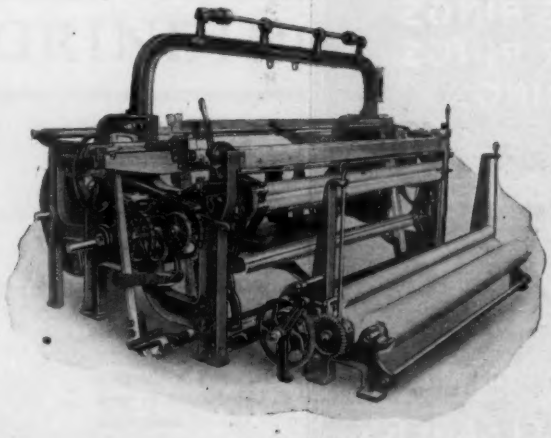
Interchangeable in every way with flyers formerly furnished. Uniform in weight with presser stiff and well balanced. Supplied in any size or quantity. Trial order solicited.

## SACO-LOWELL SHOPS
### IMPROVED TEXTILE MACHINERY

SHOPS AT

LOWELL, MASS. NEWTON UPPER FALLS, MASS. BIDDEFORD, ME.
Pawtucket Spinning Ring Co., Central Falls, R. I.
EXECUTIVE OFFICES: BOSTON, MASS.
ROGERS W. DAVIS, Southern Agent, CHARLOTTE, N. C.
Southern Branch Office: Greenville, S. C.

# CORD FABRIC LOOM



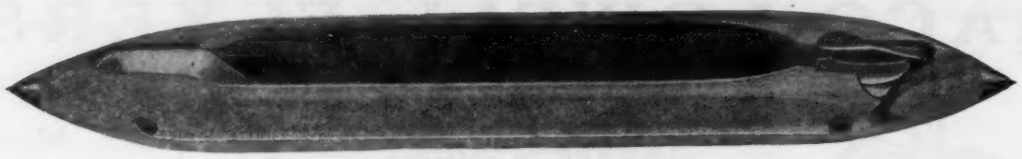
The picture shows the Crompton & Knowles Cord Fabric Loom with Double Roll Independent Winder.

This loom weaves cloth 60" wide and with picks 2½ to 12 per inch as desired.

This is the standard weaving unit in the production of cord fabric for automobile tires. It is used almost exclusively throughout the United States in weaving the tremendous annual production of cord fabric.

## CROMPTON & KNOWLES LOOM WORKS
### WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N.J.
ALEXANDER & GARSED, CHARLOTTE, N. C.
Southern Representatives.



# MR. MILL MAN:—

Have you ever thought of a "Margin of Safety" in connection with the design of a shuttle? Experience and Research have convinced our experts that, that is a most important and essential factor. When called upon to design a shuttle, aside from the fact that coordination of parts must be perfect, each and every part that goes to make the complete shuttle is designed with that "Safety Margin" thereby insuring to you at once a shuttle of strength, durability and economy. Are you having shuttle trouble? Put it up to us, send us a sample together with a bobbin of filling. You will hear from us by return mail.

## THE J. H. WILLIAMS COMPANY

"THE SHUTTLE PEOPLE"

MILLBURY, MASS.

*Geo. F. Bahan, Southern Representative*

SPINNING RING SPECIALISTS
1873 – FOR FIFTY YEARS – 1923

SPINNING RINGS
TWISTER RINGS
SILK RINGS

DIAMOND FINISH
TRAVELLER CLEANERS
TRAVELLER CUPS
GUIDE WIRE SETS

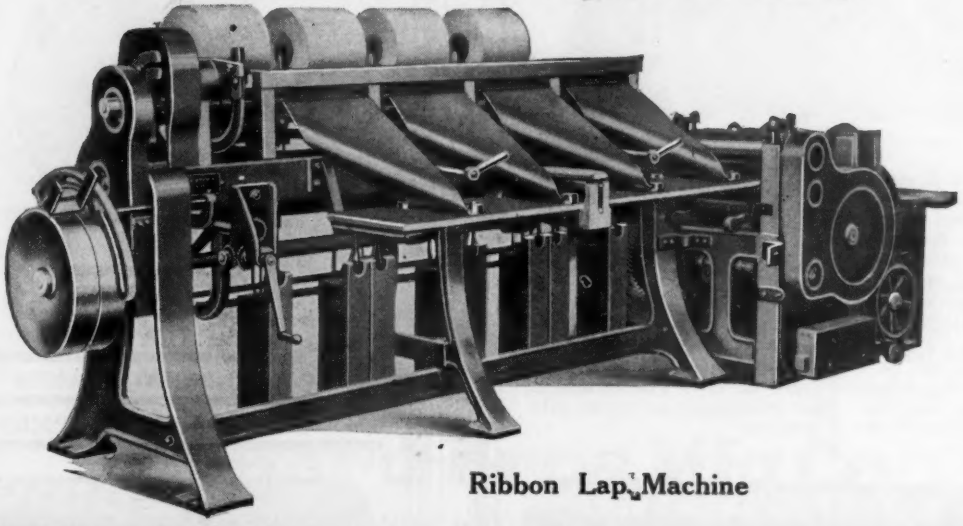
WHITINSVILLE
SPINNING RING CO.
WHITINSVILLE, MASS.

# WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY

**Manufacturers of Combing Machinery**



Ribbon Lap Machine

MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE N.C.

*Established* *1868*

# GRINDING MACHINERY

B. S. ROY & SON CO. 1868 MADE IN AMERICA TEXTILE GRINDING MACHINERY WORCESTER, MASS. U.S.A.

## *For Every Textile Grinding Need—*

Modern facilities and skilled workmen coupled with over 50 years experience and careful research work have enabled us to produce textile grinders worthy of the name "Roy."

"Experience" is the foundation of the present success of Roy Grinding Machinery and every iota of knowledge in the Roy organization is embodied in our grinders. With these facts substantiating Roy quality, we feel safe in stating that our grinding machinery will give utmost satisfaction and years of service in operation.

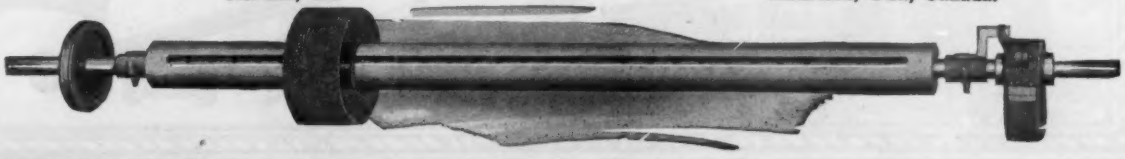
We manufacture grinders for Cotton Cards, Worsted Cards, Woolen Cards, Napper Rolls, Calender Rolls, Garnetts, etc.

We want *you to* have our literature and complete data. Write us.

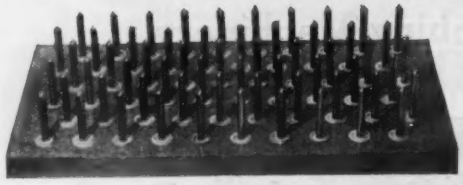
*B. S. Roy & Son Co.* *Worcester, Mass.*

E. M. Terryberry, Southern Agent,
1126 Healey Bldg.,
Atlanta, Ga.

Canadian Representative,
W. J. Westaway, Ltd.,
Hamilton, Ont., Canada.



# KORE-LOKT
REG. U. S. PAT. OFFICE
## PIN BOARDS



Patent Rights Pending

**Are You Responsible**

for good weaving in your mill? If so, you should know Kore-Lokt Pin Boards and the story of their usefulness in modern loom equipment.

Expert Opinion from men in charge of the weave rooms in prominent mills is available to superintendents and overseers upon request.

Send for this information so you may know the merits of Washburn Kore-Lokt Pin Boards as an improvement over old style Filling Boxes. Learn how the other fellow checks up results from the "Build of Bobbins."

NEW BEDFORD, MASS

# PERFECTION SHELL ROLLS

FOR

BLEACHERIES

BALL WARPING

FINISHING PLANTS

CORD FABRIC SHIPMENTS

NEW BEDFORD, MASS.

# VERMONT SPOOL & BOBBIN CO.
OF
## BURLINGTON, VERMONT.

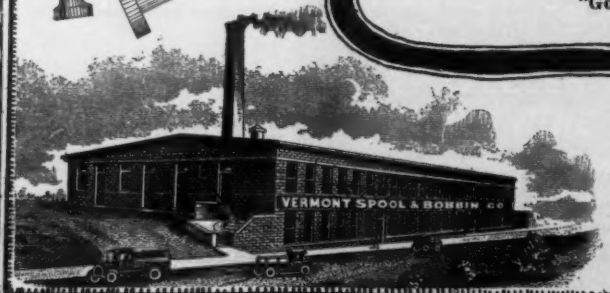
There are two prime requisites in the production of superior bobbins and spools—the plant and long experience. We have both.

Our plant is equipped with the most up-to-date and efficient machinery. From the selection of the wood to the finishing of the product the same care is exercised in every department—uniform bobbins and spools of the highest class being the result.

Our long experience in the design and manufacture of spools and bobbins for textile mills all over the country enables us to understand your requirements and give you 100% satisfaction.

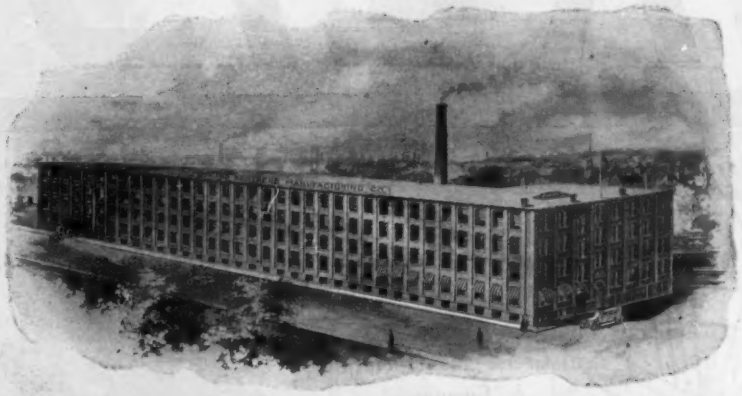
Give us a trial order and you will remain one of our satisfied customers. Write for prices.

"Good Goods at Fair Prices."



# CARD CLOTHING

Cylinder Fillets
Doffer Fillets
Top Flats Reclothed
Napper Clothing
Wire Heddles
Hand Stripping Cards
Stripper Fillets
Burn'sher Fillets
Emery Fillets



A complete stock is carried in Atlanta, where you will also find a complete service for recovering all flats, promptly, and in case of need there are extra sets of flats that can be loaned while your flats are in transit.

## Howard Bros. Mfg. Co.

HOME OFFICE AND FACTORY, WORCESTER, MASS.
Southern Agent E. M. Terryberry, 1126 Healy Building, Atlanta, Ga.
Ass't Southern Agent
Guy L. Melchor, 120 So. Forsyth St.
Atlanta, Ga.

# *Experience*

Just as Edison put electricity to work and Watt put steam to work, so B. F. Sturtevant, sixty years ago, made the first "blower," thus harnessing Air to the service of mankind.

Pioneers in the design and manufacture of air-moving apparatus, the Sturtevant Co. maintains an extensive research and laboratory service for the continual development and improvement of various systems wherein air is put to work.

When designing air-conditioning systems, the W. L. Fleisher Co. has all the vast experience and knowledge of the B. F. Sturtevant Co. upon which to draw.

Our air-conditioning specialists will gladly co-operate with you and make recommendations—without the slightest obligation.

Sales Offices

| | | |
|---|---|---|
| Atlanta | Detroit | Portland |
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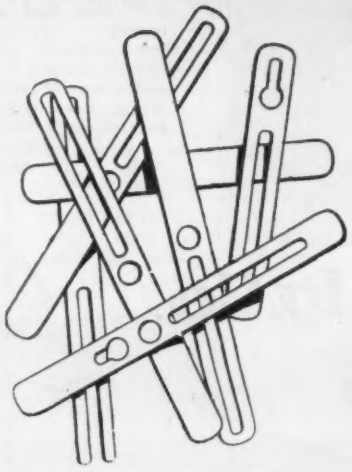
| Buffalo | Los Angeles | St. Louis |
| Chicago | Minneapolis | Salt Lake City |
| Cincinnati | New York | San Francisco |
| Cleveland | Philadelphia | Seattle |
| Dallas | Pittsburgh | Washington |

Sturtevant
PUTS AIR TO WORK
HYDE PARK, BOSTON, MASS.

W. L. FLEISHER & CO., Inc.
31 Union Square West
New York, N. Y.

725

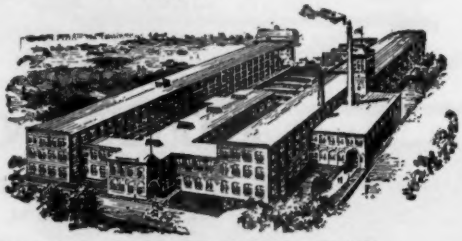
# GREIST



## Satin Finish Loom Drop Wires
### are *Good Wires*

Uniformly made—free from burrs.
A reliable source of supply.

**The Greist Manufacturing Company,**
**Dept. "C"**
**New Haven, Conn.**



**Southern Representative**
**SLAUGHTER-McCABE COMPANY, INC.**
**GREENVILLE, S. C.**

## Obtain Standardized Costs Set Piece Work Rates

**Here's the Watch for Every Textile Time Study Job**

Only six seconds waste on an operation in an eastern factory—but locating it with the watch saved thousands every year. A nationally known Textile concern says: "We eliminated one-fourth the labor, cut costs by 23%." Cheney Bros., Champlain Silk Mills, Unity Spinning Mills and many others are doing the same thing. How? By Time Studies with Silberberg watches. Whether it's locating wastes, setting piece work rates, establishing bonus systems or many other uses—there's a Silberberg instrument specially made for the job.

The Decimal Duration Watch—Gives production figures up to three minute jobs with special arrangements for timing jobs up to 30 minutes. It also has the decimal dial and "take out time" feature.

With each purchase of any type of our watches we will include at no additional charge one set consisting of our 3 Text Lesson Course on "TIME AND MOTION STUDY" including how to set Piece Work Rates and how to obtain accurate Labor Costs. All data contained herein broadens the scope and use of Time Study Watches in the Industries.

This course regularly sells for $10.00. Absolutely FREE with each Watch. Send for illustrated pamphlets and catalogues. Any of our instruments on approval to responsible concerns.

**MORTIMER J. SILBERBERG CO.**
People's Gas Bldg.
CHICAGO
Pioneers in the Manufacture and Sale of Time Study Watches.

The watch illustrated at the top with the decimal dial and "take out time" features gives direct readings in production per hour up to one minute jobs.

The Master Chronograph

## The Palmer Adjustable Thread Guide

**For Ring Spinning and Twisting Frames**

**Easily Adjusted.**

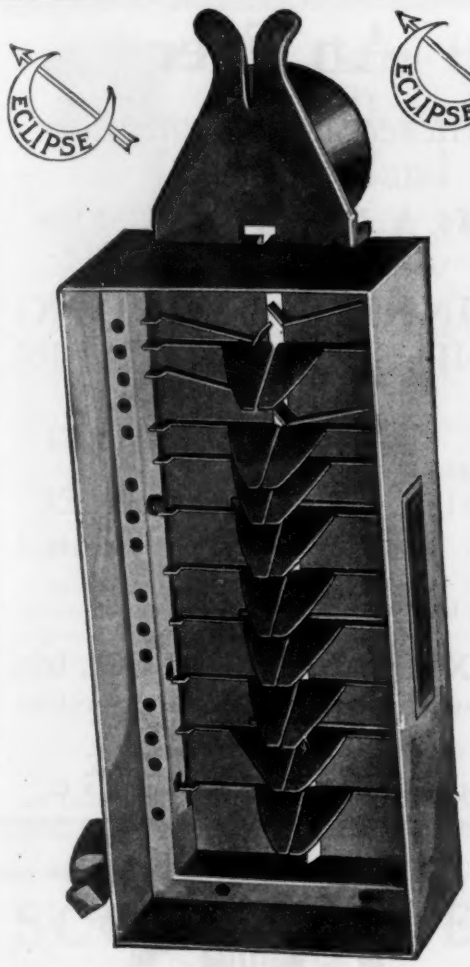
**Extreme accuracy and permanence of setting.**

**Cheapest of them all.**

**Mail guide-block for free sample.**

**Patented and manufactured by**

**THE I. E. PALMER COMPANY**
**Middletown, - - - Connecticut**




*The*

# ECLIPSE

***Automatic Yarn Cleaner***

**eliminates piecing, threads easily and instantly, and automatically removes dirt, sand, slugs, bunches and all foreign matter from the yarn. It involves a new principle whereby the yarn is cleaned by flexible blades which constantly vibrate.**

**Does not affect the strength and elasticity of the yarn. Small, compact and easily attached.**

**The ECLIPSE Yarn Cleaner is proving entirely satisfactory in mills all over the country.**

**Let us have your inquiry for full details. When writing, state make of spooler or winder.**

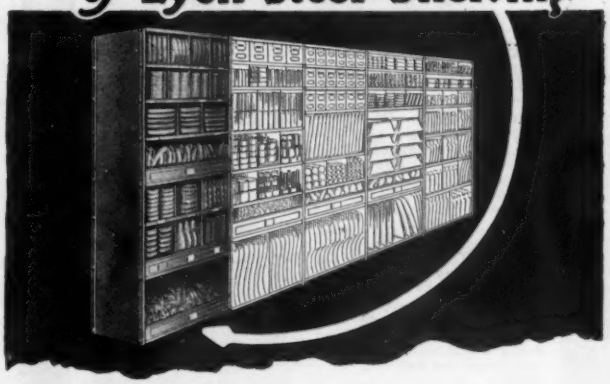
## ECLIPSE TEXTILE DEVICES, Inc.

**ELMIRA, N. Y.**

**Makers of Automatic Yarn Cleaner, Automatic Stop Motion, Yarn Tension Device**



## Start With a Single Section of Lyon Steel Shelving—



# Add To It As Needed

When you need additional capacity — when a wooden rack must be replaced — when a new requirement for storage space arises — use Lyon Steel Shelving.

Shipped from stock, in standard sizes, and erected without the need for special tools, it can be added to, rearranged or moved, any time—a week, a month, or a year from now.

Those who use Lyon Steel Shelving find it surprisingly economical. Its first cost is scarcely more than wood while its adaptability and durability make it a permanent investment.

Do not think of steel shelving as usable only for special requirements. Lyon Steel Shelving will store anything.

**Asking the nearest District Office for more information incurs no obligation.**

## Lyon Metallic Manufacturing Co.

**Aurora, Illinois**

**New York Chicago Boston Philadelphia Pittsburgh Rochester Los Angeles Detroit Cleveland Indianapolis**

*There is an authorized agent near you. Write for his address.*

## Leading cotton and silk mills order Lewis Box Trucks and Shipping Boxes

For their remarkable durability in hard service—for their aid in cutting production costs and making it easier to handle delicate fabrics—Lewis Box Trucks and Shipping Boxes are in demand by leading textile mills everywhere, including these typical users:

*Holeproof Hosiery Co., Milwaukee, Wis.*
*Houghton & Dutton Co., Boston, Mass.*
*Vesta Underwear Co., Providence, R. I.*
*Crane Bros., Kingston, Pa.*
*Francis Willey & Son, Boston, Mass.*

This recognized superiority of the Lewis line comes of 30 years experience in weaving wood and wire into the most durable containers and those that give lowest final cost. Write us regarindg Lewis containers and the newest ideas for handling textiles in process and in shipment.

G. B. LEWIS COMPANY
WATERTOWN DEPT. C-4 WISCONSIN

*Save one-third the freight cost by having them shipped knocked down.*



# An Ever *Increasing Demand* For "AMTEX"

## SPINNING, TWISTING AND SPOOLER TAPES

*From*

*Southern Spinners*

THE QUALITY AND PRICE RECOMMEND THEM

*Manufactured by*

AMERICAN TEXTILE BANDING CO., Inc.

GERMANTOWN, PHILADELPHIA, PENNA.

**Sold in the South by**
**Charlotte Supply Co., Charlotte, N. C.**
**James Supply Co., Chattanooga, Tenn.**
**Montgomery & Crawford, Spartanburg, S. C.**



# REEDS

For Cotton, Woolen, Worsted, Silk, Tire Fabrics, Webbing, and Wire Cloth.

We make a specialty of all Metal reeds, for Tire Fabrics, and Leno work.

## HAYES LOOM REED & HARNESS CO.

182 Farm St. Woonsocket, R. I.

## AMERICAN SUPPLY COMPANY

**PROVIDENCE, R. I.**

MANUFACTURERS OF

Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping,
Etc.

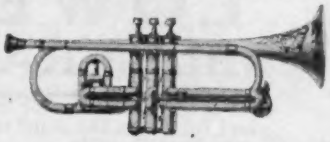
**We make a specialty of Harness for Warp Drawing Machines**

**NOTE—No orders too large for our capacity. None too small to receive careful attention.**

*John Philip Sousa endorses Conn instruments.*

## Let Conn Help You Organize a Band

Our half-century of experience is at your disposal. We'll gladly advise with you regarding the benefits of a band or orchestra and explain how the details of organization can be carried out without obligation to you.



**Complete Sets of Instruments at Reasonable Prices**

Conn equipment insures rapid progress because Conn instruments are **easiest to blow** and possess many exclusive features which make them most desirable for artists and beginners as well.

**For Complete Information Write**

**C. G. CONN., LTD.**

**415 Conn Bldg.** **Elkhart, Indiana**

## MEECO

**SANITARY DRINKING FOUNTAINS**

**are**

**ECONOMICAL**
**DURABLE**
**PRACTICAL**
**EFFICIENT**

**ICE COOLED**

Low first cost and up-keep.

*Write today for proof.*

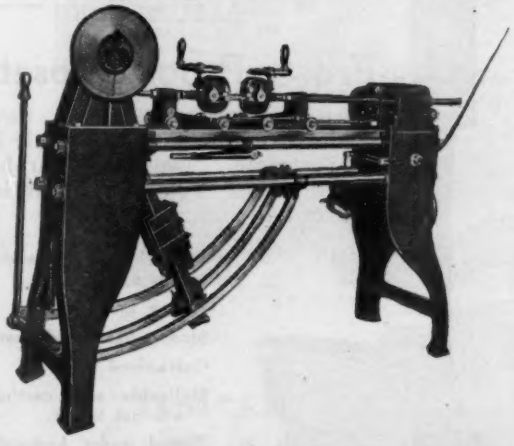
METAL MEECO PRODUCTS

**MFG. EQUIPMENT & ENG. CO.**

*Originators and Largest Makers of Ice Cooled Drinking Fountains*

**FRAMINGHAM, MASS., U. S. A.**

## SCOTT TESTERS



**THE SCOTT HORIZONTAL 800 LBS. CAPACITY—INCLINABLE BALANCE FABRIC TESTER**

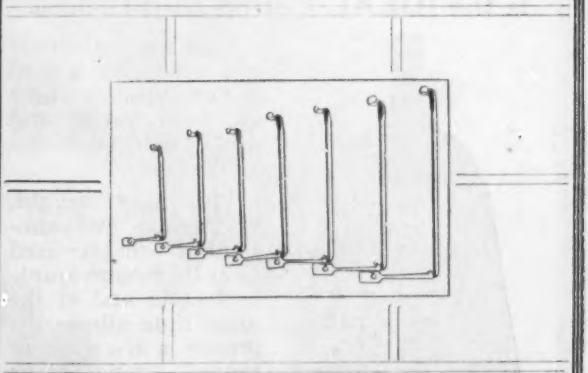
An American Invention, Built in America by Skilled American Mechanics and adopted as the Standard for testing all heavy fabrics for American requirements.

We also build the Standard Testing Machines for Light Fabrics, Yarns, etc.

**HENRY L. SCOTT & CO.**

**BLACKSTONE & CULVER STS., PROVIDENCE, R. I.**

## Passing It On!



We could not manufacture perfect flyer pressers unless a thorough understanding of cotton mill machinery enabled us to make each presser to perform its duty efficiently, economically and in perfect harmony with the other parts of the machinery. Our flyer pressers are a factor helping operation, increasing capacity and reducing maintenance costs.

**Southern Spindle & Flyer Co., Inc.**

**Charlotte, N. C.**

**Manufacturers, Overhaulers and Repairers of Cotton Mill Machinery**

W. H. MONTY, Pres. & Treas. W. H. HUTCHINS, V. Pres. & Sec.

# What Are You Paying for?

You always know exactly what you are paying for if you have the

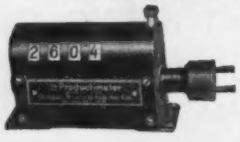
## The Productimeter

Your operatives know exactly what they are producing. This labor, time and dispute saver is always right. It always performs its duty—making correct count—without fear or favor. Absolutely impartial—just—alike to operative and employer. Know more about this efficiency aid.

*Write today for our Catalog*

**There is a Productimeter for every machine.**

**DURANT** *Manufacturing Company*



**633 Buffum Street,**

**Milwaukee, Wisconsin.**

(1625)

TRADE MARK

# LOWELL MILL CRAYONS

the original crayons for textile mill use, and for years the standard with America's leading mills.

Lowell Crayons are made in white and 15 colors, as follows:

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Yellow | Red | Pink | Blue | Purple | Brown |
| 7 | 8 | 9 | 10 | 11 | |
| Black | Green | Orange | Dark Green | Light Red | |
| 12 | 13 | 14 | 15 | | |
| Rose Pink | Light Green | Light Blue | Orange No. 2 | | Wh. |

**Order by number, please.**

## LOWELL CRAYON CO.

**Lowell, Mass.**

THE

# "Southwestern" Iron Clad

## Is the IDEAL Cotton Mill Broom

Only the best grade of broom corn is used in these brooms—they are built strong and will withstand the hardest usage.

The light weight, yet strong and substantial shields used gives the broom ample protection and at the same time allows the proper amount of broom corn to be used, thus giving them excellent sweeping qualities.

**MADE RIGHT!**
**PRICED RIGHT!**

Inquiries and orders receive prompt attention.
Sold direct and through all principal distributors.

## The Southwestern Broom Mfg. Co.

**Evansville, Indiana**

# VOGEL

PATENTED

## Frost Proof Closets

**350,000 giving satisfaction. Save Water; Require no Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.**

- Enameled Roll flushing rim bowls.
- Heavy brass valves.
- Strong hardwood seat.
- Galvanized tank.
- Malleable seat castings will not break.
- Tested under hydraulic pressure before leaving factory.

**ASK YOUR JOBBER**

## JOSEPH A. VOGEL CO.

**WILMINGTON**
**DELAWARE**

# Protection!

PROTECTING your electrical equipment not only means the saving of valuable equipment and the insurance of constant production, but many times the saving of lives. Burned out motors, exposed and defective wiring, overloaded circuits, inefficient controlling devices and numerous other electrical causes are responsible for many of the fires which occur daily in plants all over the country—fires which could have been avoided if the electrical system had been planned and installed by experts.

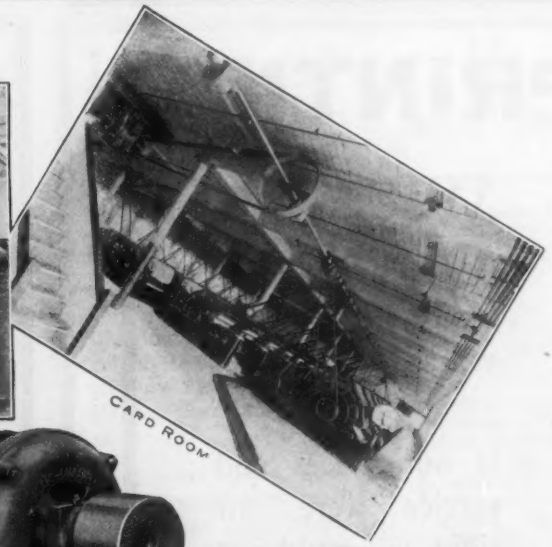
Huntington & Guerry Electrical Installations are a guarantee of utmost protection electrically, not only for the first year but throughout the years to come.

HUNTINGTON & GUERRY,
INCORPORATED
GREENVILLE, S. C.

HUNTINGTON & GUERRY TROUBLE PROOF ELECTRICAL INSTALLATIONS

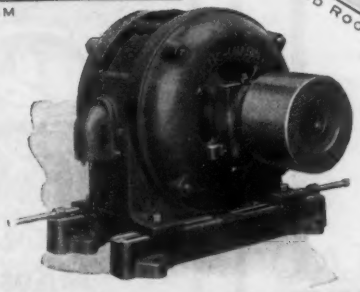
# H & G TROUBLE-PROOF ELECTRICAL INSTALLATIONS

PICKER ROOM



CARD ROOM

Type "AR" Textile Motors



Motors that meet every requirement in the Textile Industry
Send for Bulletin

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

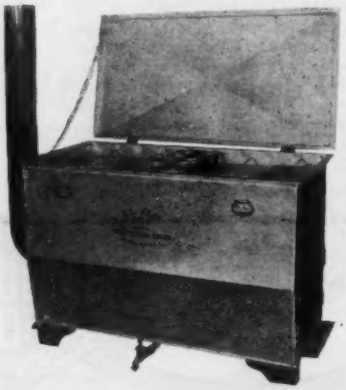
ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN. U.S.A.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

## An Important Message to every Mill Official

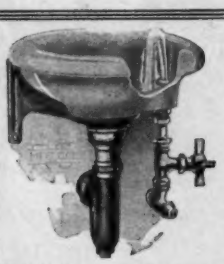
There's no doubt that you are a rigid enforcer of Sanitation in your mill lunch room and community service departments. But, did you ever question the canned foods eaten by your employes? Are they put up in the most sanitary way possible?



*El-Flo* Community Canning Outfit

are used in Textile Mills everywhere to put up can foods for mill lunch rooms and community store uses. The *El-Flo* canner is quick, easy to operate, safe, sanitary and economical. Send for booklet.

HOME CANNER MFG. CO.
HICKORY, NORTH CAROLINA

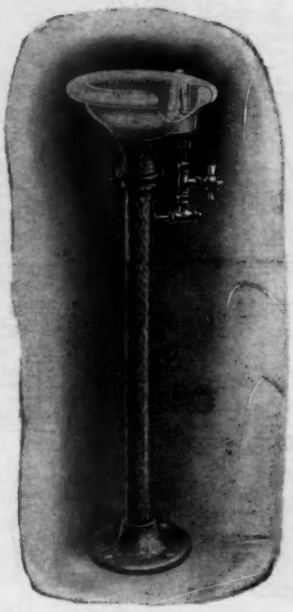


## Another Way To Save Wasted Time

Think how much time one man can waste in frequent trips to a hydrant or pail for drinking water. Can you afford to lose this much of their time and efforts when

**RUNDLE-SPENCE "Vertico-Slant" Fountains**

will bring cold, invigorating drinks to every worker AT HIS JOB. Install them throughout your mill—the investment is small compared to the saving in time and efficiency.
Note the sanitary features of the R. & S. Fountain. The stream is thrown at an angle, preventing germ-laden water from falling into the jet. LIPS CANNOT TOUCH THE NOZZLE.
Don't delay—send for our new 78-page catalog.
There's an R & S Fountain for every mill and office use.



**RUNDLE-SPENCE Manufacturing Co.**
Milwaukee, Wis.

# PRINTING

WE do it for some of the largest mills in the South—*Why not for yours?*

If our prices and service were not right, we could not do it.

**THE A. J. SHOWALTER COMPANY**
Dalton, Georgia.

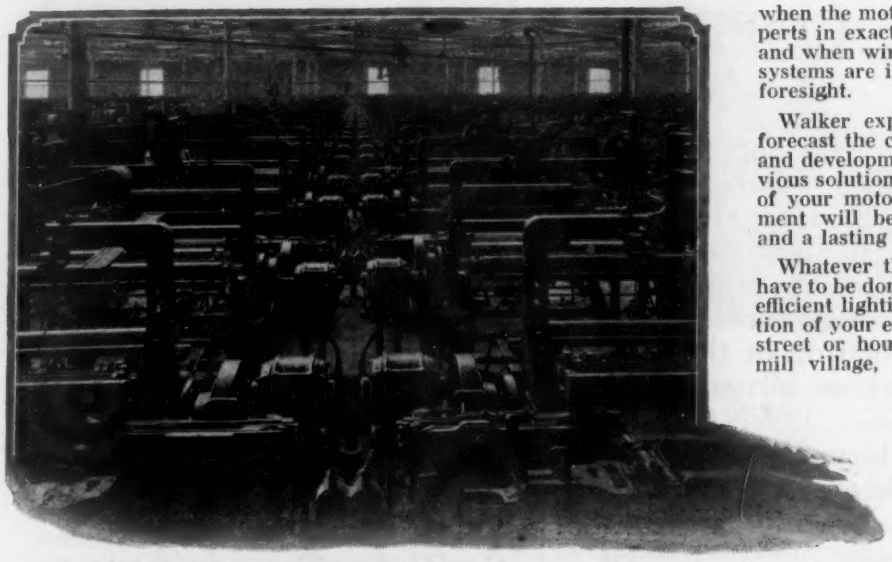
## Send for FREE story

Interesting, illustrated folder **"How to get Greater Desk Efficiency"** shows how to keep your desk cleared for action. Thousands of Kleradesks are giving entire satisfaction. Saves time locating, distributing or sorting papers. Takes less space than a tray. Sent FREE trial.

**Kleradesk**

**Mailing Lists**
Will help you increase sales
Send for FREE catalog showing details covering names of your best prospective customers. Counts and prices are given on thousands of different Mailing Lists.
99% Guaranteed by refund of 5¢ each
ROSS-Gould Co 319 10th Street St. Louis

# YOUR MOTOR INVESTMENT WILL LAST LONGER---



when the motors are installed by experts in exactly the proper positions and when wiring, fuse and switching systems are installed **right** and with foresight.

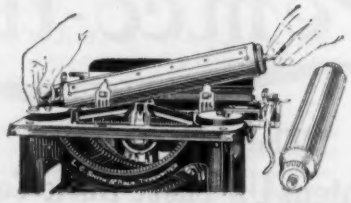
Walker experience enables us to forecast the contingencies of service and development and select their obvious solution so that the installation of your motor and electrical equipment will be permanently efficient and a lasting investment.

Whatever the electrical work you have to be done, whether it be a more efficient lighting system, the installation of your entire power equipment, street or house lighting throughout mill village, large or small repair work, your interests will be taken care of by Walker service and experience. Let us consult with you on your next work.

WALKER ELECTRIC & PLUMBING CO
ATLANTA, GEORGIA.

**Branch Offices at Convenient Points Throughout the South**

# Interchangeable Platen



One of the exclusive features of the L. C. Smith & Bros. Typewriter is the interchangeable platen.

With the use of no tools except the fingers, platens of different degrees of hardness can be inserted. There is the regular platen, the medium, the hard, and the brass platen, depending upon the number of copies desired.

Then there is the card-writing platen and the label-writing platen.

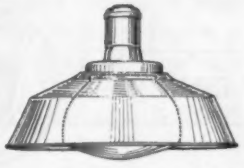
It is economical to have platens of different degrees of hardness, because a soft platen, which is used for ordinary correspondence, with one or two carbon copies, is much easier on ribbons, carbon paper, on the mechanism of the typewriter and on the nerves of the operator, as well as being much more quiet.

It is a great advantage therefore, to be able to take out a hard platen, after it has been used for a special purpose, and insert the softer platen for regular work.

Ask for folder, "Many in One."

L. C. Smith & Bros. Typewriter Co.
Home Office and Factory : SYRACUSE, N. Y.
Branches in all Principal Cities

# Industrial Lighting



*The Glassteel Diffuser Equipped With a Cast-Aluminum Holder*

We are rendering textile mills all over the Southeast prompt and efficient service, supplying not only the most efficient and effective systems of illumination particularly suited to every textile mill use, but any type of Edison Mazda Lamp desired.

Whatever your electrical requirement, be it illuminating units, lamps, motors, wiring or what not, you will find Carter Electric Service more satisfactory and prompt.

CARTER
ELECTRIC CO.
*Distributors*
ATLANTA SAVANNAH

COMPLETE LINES OF

**Wire**
**Conduit**
**Switches**
**Safety Devices**
**Fuses**
**Insulators**
**Lamps**
**Lighting Units**
**Fixtures**
**Fans**
**Street Lights**
**Motors**
**Brushes**
**Etc.**
**Anything Electrical**

QUICK DELIVERY

# YOUNGSTOWN COPPEROID STEEL SHEETS

Youngstown Copperoid Steel is becoming widely known as the most durable and rust-resisting of all metals sold at even approximately the price of ordinary steel.

It is particularly desirable for the manufacture of sheets, official tests by the American Society for Testing Materials having shown that it far outlasts ordinary steel, wrought iron or the so-called pure irons made in open-hearth steel furnaces.

YOUNGSTOWN COPPEROID STEEL is now furnished in all forms of roofing and siding, and makes the most durable and fire-resisting material for these purposes on industrial buildings, factories and mills.

## The Youngstown Sheet & Tube Company

Youngstown, Ohio

District Sales Offices

BOSTON—120 Franklin St.
NEW YORK—30 Church St.
PHILADELPHIA—Pennsylvania Bldg.
ATLANTA—Healey Bldg.
PITTSBURGH—Oliver Bldg.
CLEVELAND—1033-1040 Hanna Bldg.
DETROIT—2021-2032 First Nat'l Bank Bldg.
CHICAGO—McCormick Bldg.
ST. LOUIS—1139 Olive St.
DENVER—First Nat'l Bank Bldg.
DALLAS—1401-2 Magnolia Bldg.
SAN FRANCISCO—604 Mission St.
SEATTLE—Central Bldg.

CONCRETE — DIXIE PORTLAND CEMENT CO. ROYAL CHATTANOOGA, TENN. — PERMANENT

# MR. TAXPAYER—YOU!

**Do you want your country to spend YOUR good money on roads that will wear out before your bonded indebtedness is liquidated?**

**I SAY YOU DON'T.**

**What you want is a hard-surfaced road, with little cost for maintenance—a road that can be traveled in rain or snow, summer and winter. You want a PERMANENT road—that means CONCRETE!**

*Write for Literature—It's Free*

## DIXIE PORTLAND CEMENT CO.

CHATTANOOGA, TENN.

# Zemco-lite

TRADE MARK

## "The Cement Paint"

## Brightens Up Those Dark Corners

Paint the walls and ceilings of your mill with ZEMCO-LITE—and brighten up those dark corners, which have a tendency to create carelessness among workers.

Workers want to work in a clean, bright place—they will produce better results. They will want to keep it bright and clean. A mill painted with ZEMCO-LITE will reduce spoilage and increase profits and production.

ZEMCO-LITE is recognized among mill men as the paint for their requirements. It spreads freely, dries hard and smooth with a non-porous surface that does not catch dirt and dust, does not peel, chip, crack, flake or fall off.

First cost is reasonable, and because of its aggregate of White Portland Cement it renders frequent repainting unnecessary.

We also manufacture a complete line of paints in various colors for exterior painting, for mill village houses, for iron, brick, concrete, stucco and stone surfaces.

Let us send you our complete data and color card. No obligation. We are at your service for efficiency, economy and durability in paints. We want to hear from you.

## American Cement Paint Co.

Chattanooga, Tenn.

*CEMENT FOR PERMANENCE—*
*WHY NOT "ZEMCO-LITE?"*

## You Get Service—Only When You Pay For It

If all mill white paints carried the same price per gallon, which would you select? Naturally, the one with the best service records back of it. The initial price, then would not be the deciding factor, and in no case should it be.

When you pay a fair price for a product, whose service records make its quality unquestioned, then you are assured of service.

What then does the "initial saving" of a half dollar per gallon, more or less, mean when you permit price to be the deciding factor. Simply this—it generally means you get low price in lieu of quality—and lack of quality and proven worth means you will not get service.

***Sta-White***—the mill white paint that stays white—is not made to fit a price, but it does render service. Back of this statement stands its demonstrated value.

***Sta-White*** is specified and used in larger quantities every year in such a vast number of industrial plants and institutions, because discriminating buyers insist on service, and are willing to pay a fair price for it.

When you select ***Sta-White*** you are assuring yourself of utmost paint satisfaction with a low per year cost.

Summed up in one thought—the use of ***Sta-White*** eliminates the hazard of experiment.

**DETROIT GRAPHITE COMPANY**
555-12th St. DETROIT, U. S. A.

*Sta-White is one of the Degraco line of dependable paints. Sold through branch offices with warehouse stocks in all principal cities.*
*Manufactured in Canada by Dominion Paint Works, Limited, Walkerville, Canada.*

*Degraco Products*

*Superior Graphite Paint*
*Sta-White*
*Degraco House Paint and Varnish*
*Degraco Tone*—Flatwall finish
*Degraco Brick and Concrete Paints*
*Anti-Aqua*—damp-proof coating
*Degraco Gas Holder Paints*
*Degracolin*—concrete floor hardener
*Degraco Enamels*
*Industrial Finishes*

**DEGRACO** PAINTS VARNISHES ENAMELS
All Colors for All Purposes

## Hockaday Prevents Lime Burning

The old painter says: "I've been painting walls for about thirty years and when the Hockaday fellow told me that his paint stopped lime burning I just naturally had to smile. I've listened to eloquent speeches by paint salesmen since I was a kid. I've heard claims for paint so strong that only a slight stretch of the imagination was needed to convince one that mortar and stone and steel were only side issues, and that it was really the paint that held the building together.

"So I said, 'Young fellow, I'm from Missouri. I just finished a job and lime burning has made the wall as spotty as a Leopard. Now if your paint REALLY stops lime burning, here's a chance to prove it.' The next day he came and Hockaday'd over those spots. It *did* stop the lime burning! I am convinced that Hockaday is 'Wall Insurance.'"

### The Binder Neutralizes the Action of Lime

The binder in Hockaday—the liquid that holds the pigment together and keeps it on the wall—is the only binder that the lime in plaster will not burn or destroy. The action of the lime is neutralized and entirely overcome. This is not a mere claim. It has been proved too often.

Hockaday salesmen are experienced specialists on wall painting. Ask their advice. Get their assistance. They will gladly help you slice your painting costs in half.

**THE HOCKADAY COMPANY**
**1823-1829 Carroll Avenue**
**CHICAGO**
O. H. Johnson, Mgr., Southern Branch.
Office, Newberry, S. C.

**HOCKADAY**
THE WASHABLE PAINT FOR ALL INTERIORS

# Tough Tests for TUPELO

"THE HARD SOFT WOOD."

**For a factory floor** where the wear is **hard**
*and continuous—*

**For a warehouse floor** where the wear is **harder**
*because of heavy loads coming and going—*

**For a platform,** where the wear is **hardest**
*with heavy truck wheels constantly rolling back and forth—*

TUPELO "THE HARD-WEAR" LUMBER

TUPELO "THE HARD-WEAR" LUMBER

stands the gaff, because of its tough, closely "knitted" or "involved" grain, which prevents it from "slivering" or "kicking" up.

TUPELO is good looking, too. Takes a fine finish.

*Before placing an order for FLOORING for any use, write us and get the complete facts about TUPELO. They are interesting and we know them backwards as well as "frontwards." Address:*

**SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION**
805 Poydras Bldg., New Orleans, La., or 805 Graham Bldg., Jacksonville, Fla.

Interior View

## The Famous DIXIE Ventilator

This is not just another ventilator for a hole in the roof, but a scientific design that is the result of 15 years of ventilation research. The construction forces the vitiated air out and at the same time replaces it with pure, fresh air, doing it continually and efficiently. The "Dixie" Ventilator is one of the quality products of the South's oldest and largest metal product manufacturers. Skilled engineers and architects are at the service of Southern mills ready to work out your plans and make valuable suggestions in the use of any one of our products, which include:

DIXIE VENTILATORS
PORTABLE ALL-STEEL GARAGES
SLIDING FIRE-PROOF DOORS
METAL FRAME WIRE GLASS WINDOWS
UNDERWRITERS TIN CLAD DOORS AND SHUTTERS
GALVANIZED GUTTERS AND FITTINGS
GALVANIZED PIPE AND FITTINGS
GALVANIZED WALL TIES AND PLUGS
GALVANIZED METAL SHINGLES
GALVANIZED CORRUGATED SIDING
GALVANIZED ROOFING
GALVANIZED PRESSED BRICK SIDING
GALVANIZED CORRUGATED SHEETS
GALVANIZED VALLEY ROLLS AND RIDGE ROLLS
GALVANIZED TANKS
METAL CEILINGS
METAL CORNICES
METAL SKYLIGHTS
COMPOSITION ROOFING
SLATE ROOFING
ASPHALT SHINGLES
BLOW PIPES
SMOKE STACKS
ETC., ETC.

*The prices are right---The service is prompt. Your satisfaction is assured on anyorder, large or small. Catalogs sent gladly on request*

**Dowman-Dozier Mfg. Co.**
ATLANTA, GA., U. S. A.
Manufacturers—Contractors—Sheet Metal Products

# GET IN LINE—

Where the breaking strength of the yarn is a matter of importance Mill men are equipping their Slasher Cylinders with Ball Bearings.

Let us quote you on our Ball Bearing Truck Rollers. We have the easiest and most satisfactory method of applying ball bearings to Slashers.

A set will convince you.

**ALDRICH MACHINE WORKS**
Ball Bearings
Greenwood, S. C.

# CYCLONE HOISTS
HIGH SPEED

## —lift your production curve!

FASTER, smoother production at less cost *is and always will be* a problem for factory management. A Cyclone Hoist is always one sure means toward that end!

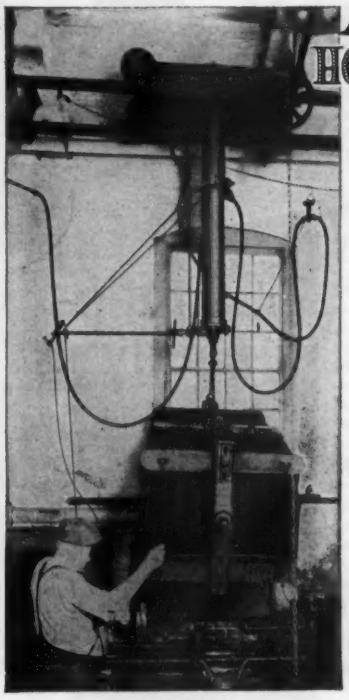
One of the largest factories in the world, famous for the wonderful, efficient production methods developed, has found this repeatedly true. We have just received their order for another lot of more than two hundred Cyclone Hoists. Put a Cyclone on *your* production curve!

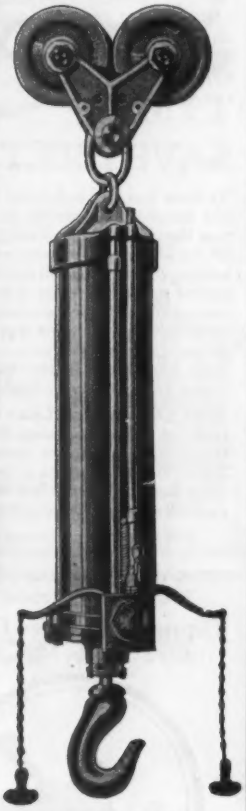
The Chisholm-Moore Mfg. Co.
Cleveland, O.
*Hoists : Cranes : Trolleys*

*Branches:*
NEW YORK : CHICAGO
PITTSBURGH

Catalog sent on request. We have capable distributors in all localities to aid you in lay-out of material-handling and hoisting systems and submit estimates. Write.

# CURTIS
## AIR HOISTS





## Used in The Textile Industry

*"Lift it with air"*

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

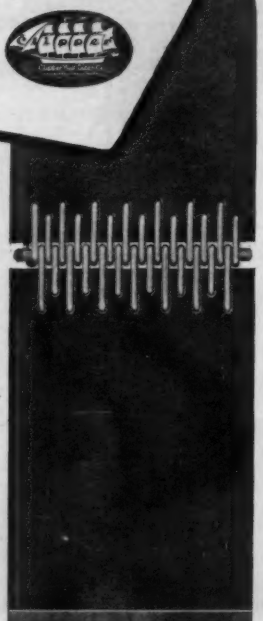
Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

**Curtis Pneumatic Machinery Co.**
1571 Kienlin Ave. St. Louis, Mo.
Branch Office
532-R Hudson Terminal New York

CURTIS
AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES
ST. LOUIS
C.P.M'f'g Co.

*Established 1854*

# A Smooth, Strong, Flexible, Lasting Joint



## SAVES TIME— SAVES BELTS

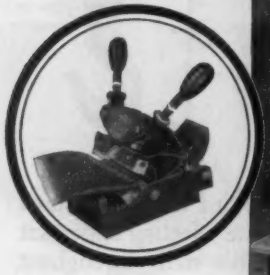
To have just one belt laced by old fashioned methods costs you the time of the millwright, of the idle machine operators waiting for him to finish his job, loss of production, the depreciation of a costly belt weakened by punching, constant loss of power due to uneven joint and early repetition of the work owing to weakening of belt.

With a Clipper Belt Lacer the cost is three minutes time, plus the necessary Clipper hooks. These hooks produce a joint more flexible than the belt itself and will not injure your belting.

*Sold by Mill Supply Dealers in All Principal Cities*

Mark the Coupon and Mail With Your Letterhead

**Clipper Belt Lacer Co.**
Grand Rapids, Mich.



*Anyone can lace a belt with the*

**Clipper**

COUPON

- ☐ Please send Clipper Belt Lacer on 30 days trial.
- ☐ Please have salesman call and demonstrate Clipper Belt Lacer.
- ☐ Please send full information regarding Clipper Belt Lacer.

Name_____

Address_____

## WHY LIGHT - DOUBLES PAY

LIGHT double leather belts work better than singles, especially wide singles on many drives with pulleys above five inches in diameter.

The doubling increases the transmission capacity, reduces the liability to stretch, and makes possible a more even thickness.

*When built as* RHOADS LIGHT-DOUBLES *are built* they run truer than singles, are better for step and flange pulleys, for shifting, and for other shop and factory drives not needing regular doubles.

RHOADS BELTS give strong pull and greater output.

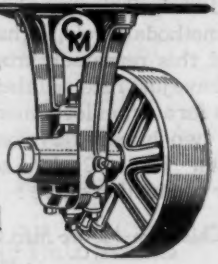
TANNATE LACE LEATHER OUTLASTS RAWHIDE FROM THREE TO FIVE TIMES.

**J. E. RHOADS & SONS**

PHILADELPHIA, 30 N. THIRD ST.
NEW YORK, 130 BEEKMAN ST.
CHICAGO, 230 W. RANDOLPH ST.
FACTORY AND TANNERY, WILMINGTON, DEL.

# CRESSON-MORRIS

**POWER TRANSMITTING MACHINERY**



Power transmitting machinery
Shafting
Rope transmission
Machine moulded and cut iron and steel gears for heavy service.
Complete plant equipment.
Engineers; founders; machinists.
Sugar centrifugals.

**CRESSON-MORRIS CO.**

PHILADELPHIA, PENNSYLVANIA

Branch Office:
608 Little Bldg., 80 Boylston St., Boston, Mass.

HH-X

Sixty Years Experience as Engineers-Founders-Machinists

# Chapman

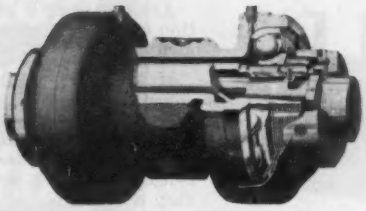
## Stop that excessive Waste of Power

*"You Pay for them Whether You Buy them or Not"*

## Reduce Oiling and Maintenance Costs

Chapman Ball Bearings are effecting savings in power costs from 15% to 35% over the old power wasting method of using babbitted and solid bearings.

They permit speeding up of shafting and machines—thereby increasing production or making available more power for new machinery.



Chapman Ball Bearings require no attention except greasing once or twice each year. They are absolutely dust proof and drip proof. Compare with the old expensive way of daily oiling—spoilage of goods from dripping oil—replacement of worn bearings—noise—and all other unnecessary bearing troubles.

*You actually pay for Chapman Ball Bearings whether you buy them or not.*
*They soon save their cost.*

***Shall we send complete information?***

***To Whom? Where?***

**THE TRANSMISSION BALL BEARING CO., INC.**

1050 Military Road

BUFFALO, N. Y.

BRANCH OFFICES: New York Chicago Philadelphia Cambridge, Mass. Toronto, Canada.
Representatives in Principal Cities.

# The Quickest and Easiest Way to Lace Belts

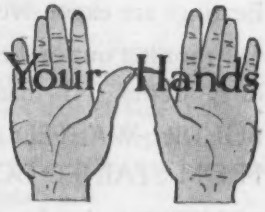
## Bristol's Patent Steel Belt Lacing

### Almost as Simple as Driving a Nail

A Hammer

A Piece of Soft Wood

Your Hands



It makes a good joint, too.

—Doesn't cost much to have a few boxes on hand.

They will save you dollars in time gained, which would otherwise be lost by slower methods of belt lacing.

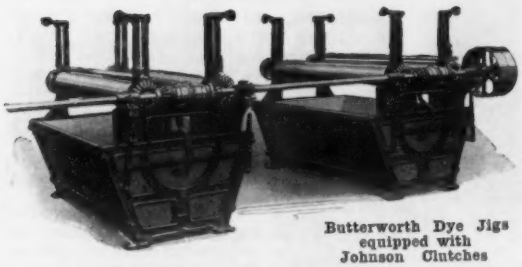
*Did you get a copy of Bulletin 713-J?*

**THE BRISTOL COMPANY : WATERBURY, CONN.**

Boston New York Philadelphia Pittsburgh Detroit
Chicago St. Louis San Francisco

# THE JOHNSON FRICTION CLUTCH

## *That Drive on Your Dye Jigs— Has It Ever Caused Trouble?*



Butterworth Dye Jigs equipped with Johnson Clutches

### Friction Control Means Better Machinery

There are many drives in the dye house which can be handled most efficiently by a good friction clutch. We design clutches to meet any requirements and are always glad to consult on your problems.

*Write or our Catalog G.*

Are you using a jaw clutch that jerks and grabs—or a friction clutch that slips and falls down on the job? It is a common difficulty and a troublesome one.

H. W. Butterworth & Sons Company, builders of one of the oldest and best lines of dyeing and finishing machinery, have found a decided advantage in the Johnson Clutch for this work. Dyeing establishments all over the country are now using Johnson Clutches on Butterworth machines in the arrangement shown here, and know from actual experience that they are capable of the finest service.

The Johnson Clutch has been applied with equally good results on other machines of this type, and on textile machinery generally—in the dye house and elsewhere. By its compact, enclosed design and its smooth and easy operation, it is admirably suited to the requirements of the textile shop.

Johnson Double Clutch as used on Butterworth Machines

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

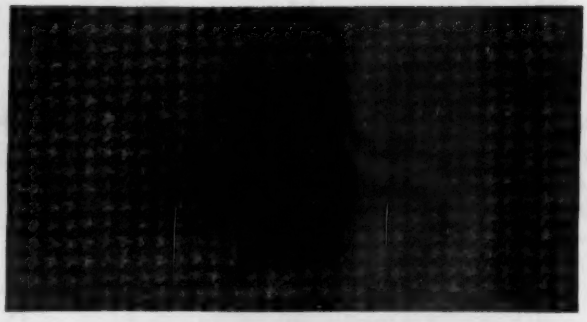
# Stained Goods!

Hot Bearings mean short life.

Bearings are expensive.

Oil running out of bearings means dirty floors and machinery. RESULTS! WASTED MATERIAL FROM STAINED GOODS.

STAYSWELL laughs at drips and spatters.



STAINED GOODS ARE EASY TO AVOID BY USING THE SNOW-WHITE STAINLESS GRADES OF STAYSWELL

STAYSWELL "STAYS PUT" on the hottest bearing, eliminating all friction.

*Let us quote you on your requirements.*

**LAMSON OIL CO., Inc.**
10 Dorrance St. Wharf
PROVIDENCE, R. I.

# Increasing Your Man Power
# Decreasing Your Pay Roll

THAT'S what happens when a Godfrey Conveyor goes to work for you—profits go up and expenses go down.

Nice thing about the Godfrey—it places your coal where you want it—in bins, boiler room or outside storage. The entire handling cost is from 5 to 7 cents per ton and one man does all the work.

No business is too small, no power plant too large to enjoy the benefits of the Godfrey Conveyor. Give us an idea of your requirements and we'll quickly tell you how the Godfrey Conveyor will serve you—and what it will cost.

**Ask for Catalog Z.**

**GODFREY CONVEYOR COMPANY**
Elkhart, Indiana, U. S. A.

**Made for maximum service not merely the average**

TRADE JENKINS MARK

*Jenkins Bros*

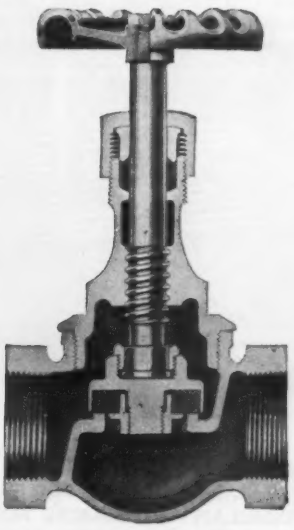


*Figure 106, sectional view, Standard Brass Globe Valve screwed*

# For hardest service imposed upon them

*Fig. 108, screwed, Standard Brass Angle Valve*

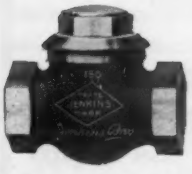


*Fig. 117, Screwed, Standard Brass Horizontal Check Valve*

You can install Jenkins Valves with confidence—they are designed, made, tested, and guaranteed to withstand the hardest service that may be imposed upon them in the use for which they are recommended.

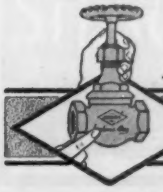
The Globe, Angle and Check Valves shown, are fitted with Jenkins Renewable Disc, which takes up wear of opening and closing, giving the valve practically unlimited life.

Valves for all requirements. Ask your supply man for genuine Jenkins "Diamond" Valves.

JENKINS BROS.

80 White Street, New York.
524 Atlantic Avenue, Boston.
133 No. Seventh St., Philadelphia.
646 Washington Boulevard, Chicago.

2735-J

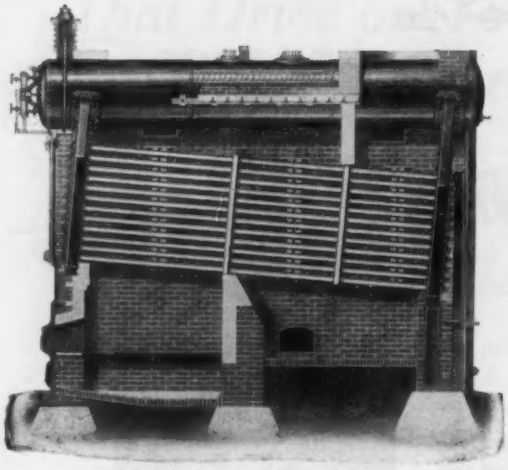


Always marked with the "Diamond"

Jenkins Valves

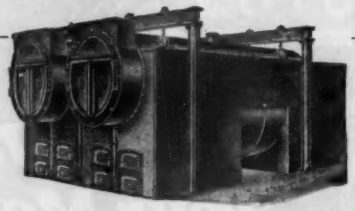
SINCE 1864

# WATER TUBE BOILERS



HORIZONTAL WATER TUBE BOILERS
VERTICAL WATER TUBE BOILERS
TUBULAR AND MARINE BOILERS
STEEL CASINGS, SMOKE STACKS

**THE CASEY-HEDGES CO.**
CHATTANOOGA, TENN.
Quick Shipment Our Specialty. Send for Catalogs.



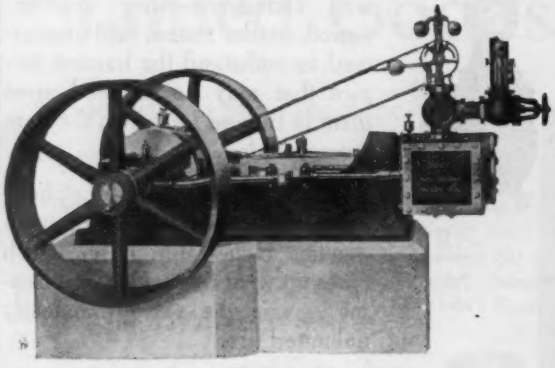
## The Result of a Quarter Century Experience

These years of experience and study together with exhaustive tests and improvements, has enabled us to build modern boilers that are second to none—in design, construction, high efficiency and capacity, economical operation, and low cost for upkeep.

Made in several types. Write us today and let us send you full data and reasons why the W & W BOILER will best meet your reqvirements.

**The Walsh & Weidner Boiler Co.**
CHATTANOOGA, TENN.

**WALSH & WEIDNER**
TUBULAR WATER TUBE **BOILERS**



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**Macon, Georgia**
MANUFACTURERS OF
**High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.**
**Heavy Castings and Wrought Iron Works.**

*Our completely equipped Oxygen Plant.*

# 99.5% PURE

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The purer the oxygen the greater the economy in welding. STANDARD Oxygen has been saving money for cotton mills all over the South.
We are familiar with the requirements of the Southern mills, and are ready—anxious to serve them in the manner in which they expect to be served.
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**STANDARD**
**OXYGEN FOR WELDING**

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**Gray Manufacturing Co.**
**Arrow Mills, Inc.**
**Parkdale Mills, Inc.**
**Flint Manufacturing Co.**
**Arkray Mills, Inc.**
**Arlington Cotton Mills**
**Myrtle Mills, Inc.**

## Our Fine Yarns Make Fine Fabrics

The manufacturers of a number of America's well known textile products can vouch for the strength, uniformity, cleanliness and better weaving and knitting qualities of our yarns.

The yarns we spin for knitting, weaving, laces and converting, are furnished in all twists on skeins, cones, tubes and warps:

30s to 80s Single and Ply Combed Peeler Right Twist. 30's to 50's Single and Ply Double Carded Peeler, Right or Reverse Twist.

20s to 60s, 2, 3, and 4 Ply, Combed Peeler, Reverse Twist.

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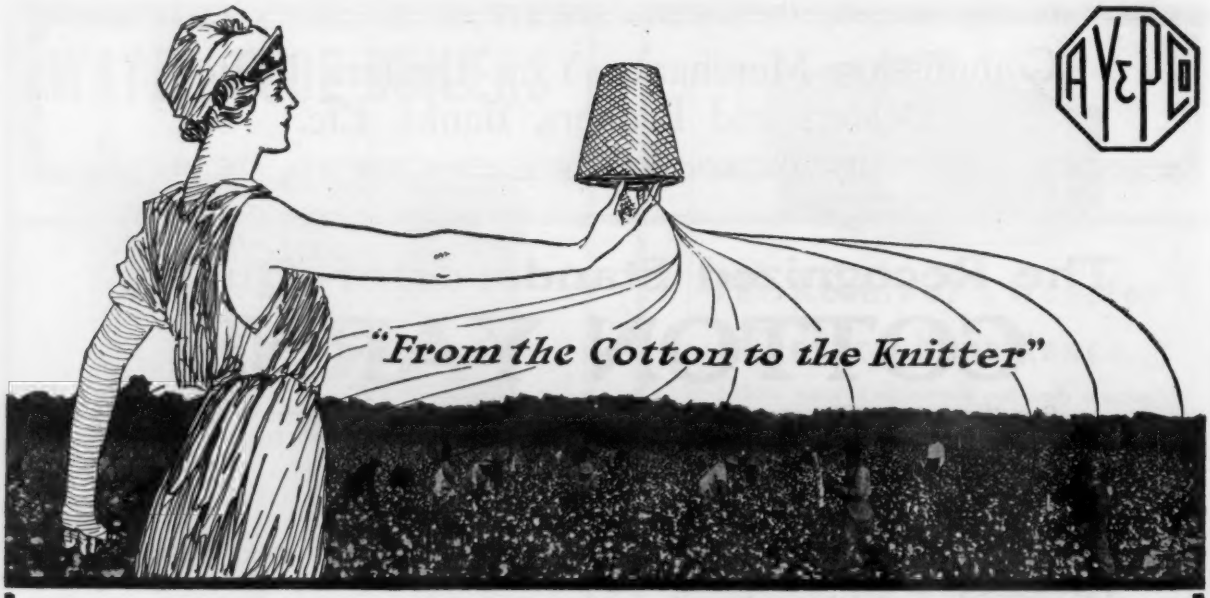


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SPINNERS AND MERCERIZERS
HIGH GRADE COMBED AND CARDED YARNS—16s to 80s
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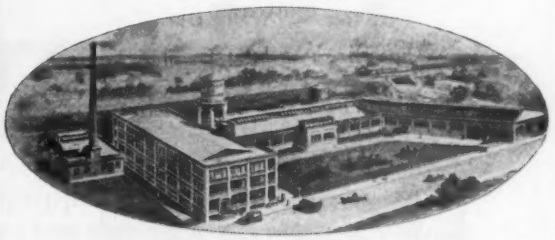

View of our Mercerizing and Bleaching Plant

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Established 1908

Spinners, Bleachers, Dyers and Mercerizers of High Grade Combed Yarns

By using our Spinning and Mercerizing you are always assured of a standard product.

***"From the Cotton Field Direct to You"***

Main Office, Factory and Warehouse
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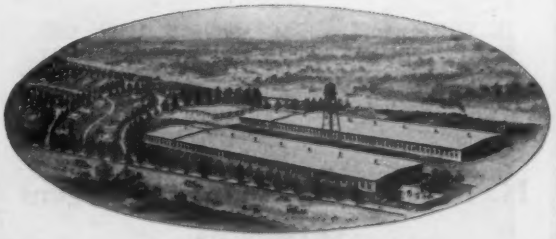

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MOST FAVORED HOTEL
500 ROOMS, EACH WITH PRIVATE BATH

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Thousands who know the Chicago of today now prefer the large hotels of the North Shore. The beautiful new Sheridan Plaza is not only "Uptown Chicago's most favored hotel," but one of America's finest. Whether you come on business or for recreation, the Sheridan Plaza will please you. Music and dancing every evening. Moderate costs. Excellent Restaurant; Narcissus Grill cafeteria. Eighteen minutes from down-town; elevated express and surface lines; motor busses to and from downtown, through Lincoln Park, stop at the door. Exceptional garage accommodations.

*European plan. Rooms, with private bath, $3.00 a day and up. Reservations are advisable.*

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**Rooms 600 Baths**

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**100 at $2.50 Single—$4.50 Double**
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**50 " $5.00 " —$7.00 "**

**50 with Twin Beds, $5.00 to $7.00**
**100 In Suite, $5.00 to $8.00, Double**
**Two Floors of Agents' Sample Rooms $5.00 per Day**
**Table d'Hote Dinner, $1.25-$2.00**

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**Under New Management**
**O. C. FROMAN, Mgr.**

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Sometimes in the preparation of your sales and advertising plans you find the need of some especially prepared piece of literature, the execution of which will baffle your photographer, electrotyper and printer. Frequently you may seek a service that the ordinary plant cannot give.

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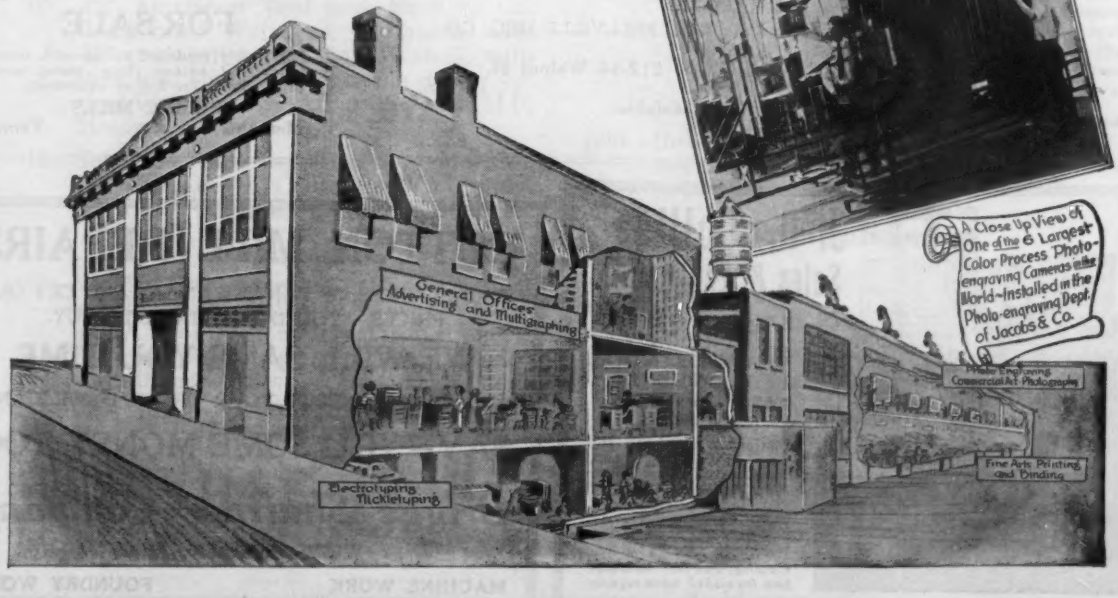
A Close Up View of One of the 6 Largest Color Process Photo-engraving Cameras in the World—Installed in the Photo-engraving Dept. of Jacobs & Co.

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***Clinton, S. C.***

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**WIRE US FOR TYPES AND QUOTATIONS.**

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**EXCEPTIONALLY FINE UNIT CONSISTING OF**

1 Willow or Opener
1 40″ H & B Breaker Lapper
1 40″ H & B Finisher
12 40″ H & B Cards with Duplex Cleaners
6 H & B Drawing Frames (24 deliveries)
2 H & B 76 Spindle Slubbers
10 H & B 204 Spindle Spinning Frames.

Full complement of Roving Cans, Trucks, Slubber and Spinning Bobbins, Change Gears, etc. This machinery was put in new about four years ago. It, therefore, is in practically new condition and thoroughly up-to-date.

Will be sold at a substantial reduction from price of new.
**Must be moved quickly as building is needed for other purposes.**

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**UNIONVILLE, CONN.**

## WANTED
## Resident Salesman

living in Greensboro or Charlotte to cover North Carolina. Leather Loom Strapping, Belting, Sheep Skins, etc. Weekly drawing account against commissions. Lines already established. Experienced man, acquainted with mill buyers preferred, altho not absolutely necessary. Give full references as to ability and integrity.

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Leather belt, 150 ft. long, 4 ft. wide, 2 ply extra heavy. Belt has been used but is in very good condition.

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A Gessner Twentieth Century Double Bed 90″ Rotary Cloth Finishing Press in excellent condition.

**SCHADEWALD,**
**3rd & Huntington Sts.,**
**Philadelphia, Pa.**

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Completely equipped cotton mill, manufacturing twines, mop yarns, and rope. Send for list of equipment.

**ROMAC MILLS**
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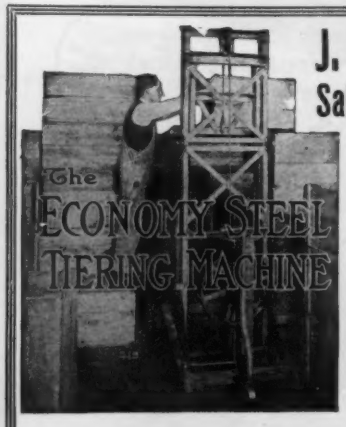


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**STORAGE AND INDOOR TRANSPORTATION EQUIPMENT**
**55½ Luckie St.**
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**Equipment that will reduce your storage and handling expenses. Tiering Machines, Electric and Hand Trucks, Overhead Carriers, Gravity and Power Conveyors of all kinds.**

***Catalogs and full information furnished upon request***

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SEND SAMPLES OF PARTS WANTED AND GET OUR PRICES. YOU DON'T HAVE TO BUY.

**WE WILL SAVE YOU TIME**

AND WON'T EXPECT YOUR ORDER IF WE CAN'T

**SAVE YOU SOME MONEY TOO**

***Briggs-Shaffner Company***

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**MACHINE WORK FOUNDRY WORK**

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## All At Bargain Prices

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25—Sargent No. 24 six section 8 foot Cotton Dryers. Overall dimensions 99′4″ long, 15′5″ wide, 7′10″ high. Equipped with Model "M" Self feeder. Hot air drawn through belt by 33″ exhaust fans. Constructed throughout of metal angles and plates.

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25—Sargent Cylindrical type 48″ Mixing Pickers. Equipped with single pair fluted feed rolls, 3½″ diameter. Cylinder provided with 6 heavy steel bars on lugs bolted to spider. Capacity 600 to 800 lbs. per hour.

### Cotton Washers

25—Sargent 48″ Special Cotton Washers or Rinsers. Complete with cast iron frame, pans, squeeze rolls, kicker and conveyor.

### Feeders

25—Sargent 48″ Model "M" Feeders for Sargent Dryers.

### Concentrators

8—Noble and Wood Concentrators right and left hand cylinder washers with octagon cylinder diameter 44″, length 42″. Rotates at 6 R.P.M. Vat is 1′4½″ wide, 6′9″ long, 2′9″ high.

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65—42″ American Tool and Machine Co. Centrifugal Wringers. Complete with 42″ perforated steel basket shell, with steel top, basket 22½″ inside depth, ⅜″ steel Wringer direct connected to 40 H.P. Motor.

18—Sets 36″ American Tool and Machine Co. Belt Driven Centrifugal Wringers. Each set arranged in batteries of three.

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40—Welded Steel Digesters. Capacity 1300 cu. ft. Inside diameter 8′, length overall 27′. Complete with cast iron supporting ring, false bottom, hoppers, guides and all accessories.

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36—823-H.P. Stirling Boilers. Class M-30, complete with all accessories. Babcock & Wilcox Co., New York, makers. 200 lbs. pressure, 630 3½-in. tubes, No. 10 gauge, 150 of these tubes are circulators. Steam drums, double riveted, double strap butt joint, 1-in. rivets. Thickness shell plate and tube ends in steam drums ⅞ in. mud drum 1 in. Space occupied by boiler 18 ft. by 22 ft. 3 in. by 29 ft. 9 in. high. Complete with all accessories.

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18—Corliss Engines. Maker Allis-Chalmers Co. 350 H.P. 18 in. x 36 in. double eccentric, semi-high speed, 125 R.P.M., simple Corliss belted type, designed to operate on 140 lbs. steam pressure with 1½ lbs. back pressure. Double eccentric allows cut off up to 75 per cent of stroke. Flywheel 11 ft. diameter by 32-in. face. Complete with Phoenix individual oiling system. Type R, size 30, made by Richardson-Phoenix Co.

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225—Slightly used Motors 7½-75 H.P. 3 Phase 60 Cycle, 440 Volt.

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1000—Steel Tanks, 100-55,000 gallon capacity.

350—Wood Tanks, New and Used

| Size | Capacity |
|---|---|
| 12′6″ x 11′ | 10150 gal. |
| 12′6″ x 18′ | 16600 gal. |

Send for Bulletin No. 7.

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500—Howe and Fairbanks Scales. Capacities 600 lbs. to 100 tons. Guaranteed to be in good condition.

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| Pulleys | Shafting |
| Pillow Blocks | Drop Hangers |
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| Floor Brackets | Floor Stands |
| Friction Clutches | Collars |

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***Let us submit our quotations and save you money***

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JACKSONVILLE, TENNESSEE

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Draper Corporation.
Economy Baler Co.
Logemann Bros.
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Transmission Ball Bearing Co.
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Morse Chain Co.
Renold, Inc., Hans.

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**BELT DRESSING.**
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Dixon Crucible Co., Jos.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

**BELT FASTENERS AND LACING.**
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Bristol Co.
Clipper Belt Lacer Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

**BELT TIGHTENERS.**
Link-Belt Company.
Rhoads & Sons, J. E.
Wood's Sons Co., T. B.

**BENCH DRAWERS.**
Lupton's Sons Co., David.

**BENCH LEGS (PRESSED STEEL).**
Lupton's Sons Co., David.

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Cocker Mch. & Fdry. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machry. Co.
Woolford Wood Tank Co., G.

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Buckeye Blower Co.
Carrier Eng. Corp.
General Electric Co.
Philadelphia Drying Mchry. Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

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Standard Fibre Co.

**BOARDS—FORM.**
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**BOBBINS.**
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Jordan Mfg. Co.
Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
Shambow Shuttle Co.
Vermont Spool & Bobbin Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.

**BOBBIN HEADS.**
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

**BOBBIN STRIPPERS.**
Crompton & Knowles Loom Works.

**BOILERS.**
Casey-Hedges Co.
Cole Mfg. Co., R. D.
International Engineering Wks., Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

**BOILER COMPOUNDS.**
Dixon Crucible Co., Jos.

**BOILER FEED WATER PURIFICATION.**
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Casey-Hedges Co.
Norwood Engineering Co.
Scaife & Sons, Wm. B.

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Casey-Hedges Co.
Crane Co.
Dixon Crucible Co., Jos.
Godfrey Conveyor Co.
International Engineering Co.
Jenkins Bros.
Lunkenheimer Co.
Nashville Industrial Corp.
Sturtevant Co., B. F.

**BOILER GRATES AND STOKERS.**
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**BOOKKEEPING MACHINES.**
Monroe Calc. Mch. Co.

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Lyon Metallic Mfg. Co.
National Vulcanized Fibre Co.
Standard Fibre Co.

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**BRAZING.**
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**BROKERS—STOCK.**
(See Stocks and Bonds.)

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(See Brushes.)

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Re-Fil-It Broom Mfg. Co.

**BRUSHES—MILL.**
Atlanta Brush Co.
Re-Fil-It Broom Mfg. Co.
Southwestern Broom Mfg. Co.

**BRUSHES—MOTOR AND GENERATOR (COMMUTATOR).**
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

**BUCKETS AND PAILS—MILL.**
Standard Fibre Co.

**BUCKETS—ELEVATOR AND GRAB.**
Link-Belt Company.

**BUCKLES—COTTON TIE.**
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**BUILDING CONTRACTORS.**
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**BUILDINGS (ALL STEEL).**
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Maryland Metal Building Co.

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Barrett Co., The
Birmingham Slag Co.
Bogart & Carlough Co.
Dixie Portland Cement Co.
Detroit Graphite Co.
DeVilbiss Mfg. Co.
Dowman-Dozier Mfg. Co.
Dowman, George.
Dufur & Co.
Hough Shade Corp.
Knapp Fence Co.
Lupton's Sons Co., David.
St. Louis Surfacer & Paint Co.
Maryland Metal Building Co.
Richardson Co.
Sanymetal Products Co.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.
Truscon Steel Co.
Variety Fire Door Co.
Wagner Mfg. Co.
Walker Electric & Plb. Co.
Ware Paint Co.

**BURR PICKERS.**
Proctor & Schwartz, Inc.
Sargent's Sons, C. G.

**BUSHINGS.**
Southern Spindle & Flyer Co.

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Textile Finishing Mchry. Co.

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Carter Electric Co.

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Beiger Co.

**CANNING OUTFIT.**
Home Canner Co.

**CANS—ROVING.**
National Vulcanized Fibre Co.
Standard Fibre Co.

**CANS (DRYING).**
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Howard Bros. Mfg. Co.

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Klauder-Weldon Dyeing Machine Co.
Macomb Machine Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons & Co., C. G.
Textile Finishing Mchry. Co.
Tolhurst Mch. Works.

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Howard Bros. Mfg. Co.
Proctor & Schwartz, Inc.
Roy & Son, B. S.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

**CARD CLOTHING.**
Howard & Bullough.
Howard Bros. Mfg. Co.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

**CARD FEEDS.**
Proctor & Schwartz, Inc.
Schofield Co., Wm.
Whitin Machine Co.

**CARD GRINDING MACHINERY**
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Smith & Furbush Machine Co.
Whitin Machine Works.

**CARPET MACHINERY.**
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Schofield, Wm., Co.
Textile Finishing Mchry. Co.

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**CARRIER SYSTEM.**
Curtis Pneumatic Machry. Co.

**CASES—WOODEN.**
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Briggs, Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

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**CEMENT REINFORCEMENT.**
Birmingham Slag Co.
Truscon Steel Co.

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Detroit Graphite Co.
Dixon Crucible Co., Jos.
St. Louis Surfacer & Paint Co.
Hockaday Co.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

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Alabama Power Co.
Georgia Railway & Power Co.
Tennessee Electric Power Co.

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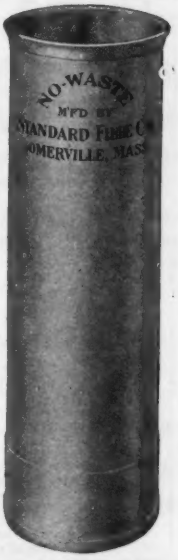


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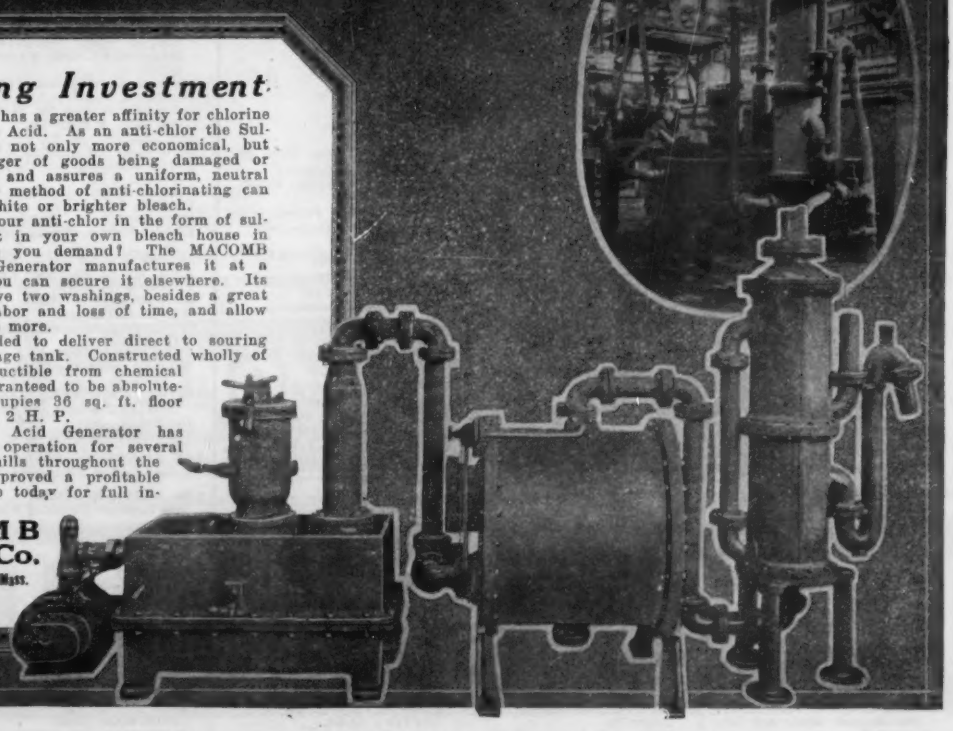

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Truscon Steel Co.

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Hunter Mfg. & Comm. Co.
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Foster Mch Co.
Schaum & Uhlinger.

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Durant Mfg. Co.
Foxboro Co.
Root Co.

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Jacobs & Co.

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Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sturtevant Co., B. F.

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Dryer Corp. of America.
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American Yarn & Processing Co.
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Franklin Process Co.

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Electro Bleaching Gas Co.
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Brandwood, John.
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Electro Bleaching Gas Co.
Ford Co., J. B.
Grasselli Chemical Co.
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Kali Mfg. Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Roessler & Hasslacher Chemical Co.
New Brunswick Chemical Co.
Pennick & Ford, Ltd.
Rohm & Haas Co.
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Cooper Hewitt Electric Co.
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Cutter Works, George.
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General Electric Co.
Ivanhoe-Regent Works.
Mason, Volney W.
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Sturtevant Co., B. F.
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Walsh & Weidner Boiler Co.
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Rax Eng'g Corp.

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Nashville Industrial Corp.
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Casey-Hedges Co.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.
Westinghouse Elec. & Mfg. Co.

**ENGINEERS (CONSULTANT AND EFFICIENCY).**
Ernst & Ernst.

**ETCHING—(PRINTING).**
Jacobs & Co.

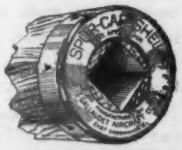
**ENGRAVING AND CUTS.**
Jacobs & Co.

**EXHAUSTERS.**
(See Blowers.)

**EXPORTERS—COTTON.**
(See Brokers.)

**EXTRACTORS—HYDRO.**
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

**FACTORY DESKS.**
Lupton's Sons Co., David.
Manufacturing Equip. & Eng'g Co.



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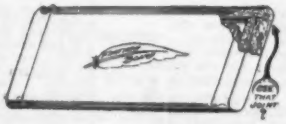

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# BUYERS' INDEX—Continued.

**FACTORY & INDUSTRIAL SITES.**
Alabama Power Co.
Georgia Ry. & Power Co.
Tennessee Electric Power Co.
Nashville Industrial Corp.

**FACTORY MANAGEMENT SYSTEMS.**
Ernst & Ernst.

**FANS—ELECTRIC.**
American Blower Co.
Buckeye Blower Co.
Carter Electric Co.
General Electric Co.
Southern Electric Supply Co.
Westinghouse Elec. & Mfg. Co.

**FANS—CONVEYING, POWER AND EXHAUST.**
(See Blowers and Blowing Systems.)

**FASTENERS—BELT.**
(See Belt Fasteners.)

**FEED WATER PURIFIERS.**
(See Boiler Feed Water Purification.)

**FEEDERS.**
(See Automatic Feeders.)

**FELT CLOTH FOR ROLLS.**
Philadelphia Felt Co.

**FELTING MACHINERY.**
Proctor & Schwartz, Inc.

**FENCE—STEEL AND IRON.**
American Fence Const. Co.
Dowman, George.
Anchor Post Iron Works.
Knapp Fence Co.

**FENCE POSTS—CREOSOTED PINE.**
Southern Wood Preserving Co.

**FIBRE PRODUCTS.**
National Vulcanized Fibre Co.
Standard Fibre Co.

**FILLETS (DOFFER—STRIPPER—BURNISHER—EMERY).**
Howard Bros. Mfg. Co.

**FILLING—CAP AND WARP.**
U. S. Bobbin & Shuttle Co.

**FILTERS—WATER.**
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

**FILTERS—OIL REMOVAL.**
Norwood Engineering Co.

**FILTERS (ALUM).**
Lennig & Co., Chas.

**FINISHING.**
(See Dyers, Bleachers and Finishers.)

**FINISHING, BLEACHING AND SIZING MATERIALS.**
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chemical Co.
Ciba Co., Inc.
Corn Products Refining Co.
Electro Bleaching Gas Co.
Ford Co., J. B.
India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Roessler & Hasslacher Co.
New Brunswick Chemical Co.
Pennick & Ford, Ltd.
Rohm & Haas Co.
Sandoz Chemical Co.
Stacy Mfg. Co., A. E.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

**FIRE DOORS AND HARDWARE.**
Dowman-Doizer Mfg. Co.
Dowman, George.
Lupton Sons Co., David.
Sanymetal Products Co.
Truscon Steel Co.
Variety Fire Door Co.

**FIRE HOSE.**
(See Hose—Fire.)

**FIRE PROTECTING PAINT.**
(See Paint.)

**FLAX SPINNING.**
U. S. Bobbin & Shuttle Co.

**FLEXIBLE COUPLINGS.**
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.

**FLOOD LIGHTS—ELECTRIC.**
Cooper Hewitt Electric Co.
Ivanhoe Regent Works.
General Electric Co.
Southern Electric Supply Co.

**FLOORING LUMBER.**
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

**FLOORING—WOOD BLOCKS.**
Southern Wood Preserving Co.

**FLOOR SCRUBBING MACHINE**
American Scrubbing Equipment Co.

**FLOOR SCRUBBING POWDERS.**
(See Scrubbing Powders.)

**FLOOR SWEEPS.**
(See Brushes.)

**FLUTED ROLLS.**
Howard & Bullough.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield & Sons, J. S.
Southern Spindle & Flyer Co.
Whitin Machine Works.

**FLYERS.**
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

**FOUNDERS.**
Briggs-Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdy. & Mch. Wks.

**FOUNTAINS—DRINKING.**
Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

**FRICTION CLUTCHES.**
(See Clutches—Friction.)

**FUEL ECONOMIZERS.**
Sturtevant Co., B. F.

**FURNITURE—MILL.**
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

**FUSES—ELECTRIC.**
Carter Electric Co.
Southern Electric Supply Co.

**GARAGES (PORTABLE—METAL).**
Dowman-Doizer Mfg. Co.

**GARNETT MACHINES.**
Proctor & Schwartz, Inc.

**GAS ENGINES.**
(See Engines—Gas.)

**GAUGES—STEAM PRESSURE, ETC.**
Bristol Co.
Foxboro Co., Inc.
Taylor Instrument Co.

**GAUGE—OIL.**
Lunkenheimer Co.

**GAUGES—WATER.**
Lunkenheimer Co.

**GEARS—SILENT.**
General Electric Co.
Link-Belt Company.
Morse Chain Co.
Renold, Hans.

**GEAR CUTTING AND CUTTERS.**
Cresson-Morris Co.

**GEAR PULLERS.**
General Electric Co.

**GENERATORS—ELECTRIC.**
(See Motors and Generators.)

**GLASSWARE AND DISHES.**
(See Dishes.)

**GOVERNORS—PUMP.**
General Electric Co.

**GRAPHIC CHARTS.**
Ernst & Ernst.

**GRAPHITE.**
Detroit Graphite Co.
Dixon Crucible Co., Jos.

**GRATES—BOILER.**
Casey-Hedges Co.
Cole Mfg. Co., R. D.
International Eng. Works.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

**GRATES—MECHANICAL.**
(See Stokers.)

**GREASE.**
(See Lubricants.)

**GREASE CUPS.**
(See Lubricators.)

**GRINDER—CARD, CYLINDER, ROLL, NAPPER AND GARNET.**
(See Card Grinding Machinery.)

**GUARDS—ELECTRIC LAMP.**
(See Electric Lamp Guards.)

**GUARDS — MACHINE, SKYLIGHT, WINDOW, ETC.**
American Fence Const. Co.
Anchor Post Iron Works.
Dowman, George.
Knapp Fence Co.

**GUIDES—THREAD.**
Mitchell-Bissell Co.
Palmer Co., I. E.

**GUMS.**
(See Finishing and Sizing Materials.)

**HALFTONES—PRINTING.**
Jacobs & Co.

**HANGERS.**
(See Shafting and Hangers.)

**HANK CLOCKS.**
(See Counters.)

**HARDWARE—BUILDING.**
Dowman, George.
Dowman-Doizer Mfg. Co.
Sanymetal Products Co.

**HARNESS—LOOM.**
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Crompton & Knowles Loom Works.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.
Hayes Loom Reed & Harness Co.

**HEADS—BOBBIN AND SPOOL.**
Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
U. S. Bobbin & Shuttle Co.

**HEATING AND VENTILATING APPARATUS.**
(See Ventilating Apparatus.)

**HEATING & PLUMBING CONTRACTORS.**
Walker Electric & Plbg. Co.

**HEDDLES.**
Crompton & Knowles Loom Works.
Draper Corporation.
Howard Bros. Mfg. Co.
Steel Heddle Mfg. Co.
Williams Co., J. H.

**HEDDLE FRAMES.**
Crompton & Knowles Loom Works.
Steel Heddle Mfg. Co.
Williams Co., J. H.

**HOISTS.**
Chisholm Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.
Euclid Crane & Hoist Co.
Link-Belt Company.
Mason, Volney W.
Morse Chain Co.

**HOPPER FEEDERS.**
(See Automatic Feeders.)

**HORNS AND MUSICAL INSTRUMENTS.**
Cable Piano Co.
Conn, Ltd., C. G.

**HOSE—FIRE.**
Collins, J. D.

**HOSIERY DYEING MACHINERY.**
Cole Mfg. Co., R. D.
Franklin Process Co.
Philadelphia Drying Mchry. Co.

**HOSIERY FORMS.**
(See Drying Forms.)

**HOSIERY LABELS, BANDS, STICKERS, ETC.**
Kirby-Cogeshall Co.

**HOSIERY PACKING.**
Kirby-Cogeshall Co.

**HOSIERY YARNS.**
(See Yarn Manufacturers.)

**HOTELS.**
Hotel Sheridan Plaza.
Hotel Tuller.

**HUMIDIFYING APPARATUS.**
American Blower Co.
American Moistening Co.
Carrier Eng. Corp.
Manufacturers Machine Co.
Parks-Cramer Co.
Sturtevant Co., B. F.

**HUMIDIFYING INDICATING INSTRUMENTS.**
Bristol Co.
Taylor Instrument Co.

**HYDRODEIKS.**
Taylor Instrument Co.

**HYGROMETERS.**
Foxboro Co.
Taylor Instrument Co.

**HYDRAULIC TURBINES.**
(See Turbines—Hydraulic.)

**HYDRO EXTRACTORS.**
(See Extractors.)

**ILLUMINATING ENGINEERS.**
Cooper Hewitt Electric Co.
Curtis, Paul W.
Huntington & Guerry.
Ivanhoe-Regent Works.
Walker Elec. & Plb. Co.
Westinghouse Elec. & Mfg. Co.

**INDICATING AND RECORDING INSTRUMENTS AND THERMOMETERS.**
Bristol Co.
Durant Mfg. Co.
Foxboro Co., Inc.
General Electric Co.
Root Co.
Taylor Instrument Co.

**INDIGO.**
(See Dyestuffs and Chemicals.)

**INDUSTRIAL SITES.**
Alabama Power Co.
Georgia Ry. & Power Co.
Nashville Industrial Corp.
Tennessee Electric Power Co.

**INJECTORS.**
Lunkenheimer Co.

**INK—STENCIL AND MARKING.**
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

**IRON WORK—ORNAMENTAL.**
American Fence Const. Co.
Anchor Post Iron Works.
Dafur & Co.
Knapp Fence Co.
Lombard Iron Works & Supply Co.
Royal Metal Mfg. Co.

**JACK SPOOLS.**
(See Spools.)

**JACQUARDS.**
Crompton & Knowles Loom Works.

**JOINT COMPOUND.**
Dixon Crucible Co., Jos.

**JUTE BAGGING MACHINE.**
Proctor & Schwartz, Inc.

**KETTLES—SIZE.**
(See Size Kettles.)

**KETTLES—SODA.**
Lombard Iron Works & Supply Co.

**KIERS.**
(See Bleaching Kiers.)

**KNIT GOODS.**
(See Cotton Cloth Commission Merchants and Dealers.)

**KNIT GOODS WASHERS.**
(See Washers—Cloth.)

**KNITTING MACHINERY AND SUPPLIES.**
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Kirby-Cogeshall Co.
Scott & Williams.
Torrington Co.
Trump Bros. Machine Co.
Wildman Mfg. Co.

**KNITTING NEEDLES.**
Torrington Co.

**LABELS FOR HOSIERY, BOXES, ETC.**
Kirby-Cogeshall Co.

**LABORATORY INSTRUMENTS.**
Bristol Co.
Scott & Co., Henry L.
Foxboro Co., Inc.
Root Co.
Taylor Instrument Co.

**LACING—BELT.**
(See Belt Lacing.)

**LAMPS—INCANDESCENT AND ARC.**
Carter Electric Co.
Cooper Hewett Electric Co.
Curtis, Paul W.
Cutter Works, George.
General Electric Co.
Ivanhoe-Regent Works of G. E. Co.
Southern Electric Supply Co.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

**LAMP GUARDS—KEY LOCKING.**
(See Electric Lamp Guards.)

**LAMP REFLECTORS.**
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis, Paul W.
Cutter Works, George.
Ivanhoe-Regent Works of G. E. Co.
Southern Electric Supply Co.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

**LANDSCAPE ARCHITECTS.**
(See Village Architects.)

**LAPPERS.**
Saco-Lowell Shops.
Whitin Machine Works.

**LAUNDRY MACHINERY.**
American Laundry Mchry. Co.
Fletcher Works.
Hunt Machine Co., Rodney.
Schaum & Uhlinger.
Tolhurst Machine Works.

**LAVATORIES.**
Crane Co.
Manufacturing Equip. & Eng'g Co.
Vogel Co., Jos. A.

**LEATHER BELTING.**
(See Belting.)

**LEATHER SPECIALTIES.**
American Supply Co.
Bond Co., Chas.
Jacobs Mfg. Co., E. H.
Williams & Sons, I. B.

**LIGHTS—FLOOD.**
Cutter Works, George.
Cooper Hewitt Electric Co.
General Electric Co.
Ivanhoe-Regent Works.
Southern Electric Supply Co.
Westinghouse Elec. & Mfg. Co.

**LIGHTING ENGINEERS AND CONTRACTORS.**
(See Illuminating Engineers.)

**LINEN YARNS.**
(See Yarns Linen.)

**LINK BELTING.**
(See Belting—Link.)

**LINTERS.**
(See Waste Dealers.)

**LIQUID CHLORINE.**
(See Chlorine.)

**LOADERS—WAGON AND TRUCK.**
Link-Belt Company.

**LOCKERS—METAL.**
Collins, J. D.
Lupton Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g. Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

**LOGWOOD EXTRACT.**
(See Dyestuffs and Chemicals.)

**LOOMS.**
Compton & Knowles Loom Works.
Draper Corporation.
Fletcher Works.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Schaum & Uhlinger.
Stafford Co.

**LOOM ATTACHMENTS—AUTOMATIC).**
Draper Corporation.
Hopedale Mfg. Co.

**LOOM HARNESS.**
(See Harness.)

**LOOP PICKERS.**
Jacobs Mfg. Co., E. H.

**LUBRICANTS.**
Dixon Crucible Co., Jos.
Lamson Oil Co., Inc.
N. Y. & N. J. Lubricant Co.
Texas Co.

**LUBRICATORS.**
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.

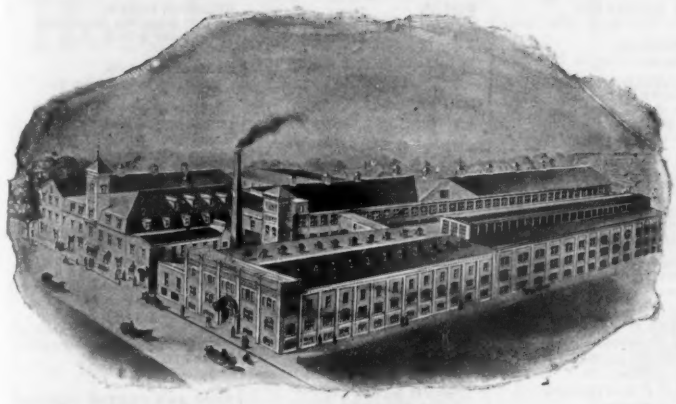
**LUG STRAPS.**
(See Straps—Lug.)

**LUMBER.**
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

**LUNCH ROOM EQUIPMENT.**
(See Restaurant.)

**MACHINE GUARDS.**
(See Guards—Machine.)

**MACHINE TOOLS.**
(See Tools.)



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Briggs-Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Works.

**MARKING POTS, STENCILS, INKS, ETC.**
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

**MERCERIZED YARNS.**
(See Yarn Manufacturers).

**MERCERIZERS.**
Aberfoyle Mfg. Co.
Amer. Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.

**MERCERIZED YARN.**
Aberfoyle Mfg. Co.
American Yarn & Pro. Co.
Boger & Crawford Co.
Dixie Mercerizing Co.
Hunter Mfg. & Comm. Co.
United Piece Dye Wks.

**MERCERIZING MACHINERY.**
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

**METAL CEILINGS, ETC.**
Dowman, George.
Dowman-Dozier Mfg. Co.
Lupton's Sons Co., David.
Truscon Steel Co.

**METAL SIDING.**
Dowman-Dozier Mfg. Co.

**METALS—PERFORATED.**
(See Screens and Sieves.)

**METAL WORKS (SHEET).**
Dowman-Dozier Mfg. Co.

**METERS—FLOW, AIR, GAS, ELECTRIC, STEAM, ETC.**
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Foxboro Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

**METERS—COUNTING.**
(See Counters.)

**MILL BASKETS AND BOXES.**
(See Boxes—Mill.)

**MILL ENGINEER.**
(See Architects and Engineers.)

**MILL VILLAGES.**
(See Villages.)

**MILL SUPPLIES—MISCELLANEOUS.**
(See Supplies—Mill.)

**MILL WHITE PAINT.**
(See Paint.)

**MOPS.**
Atlanta Brush Co.
Southwestern Broom Mfg. Co.

**MOTION PICTURES.**
(See Films.)

**MOTORS AND GENERATORS—ELECTRIC.**
Allis-Chalmers Mfg. Co.
American Blower Co.
Carter Electric Co.
Curtis, Paul W.
General Electric Co.
Nashville Industrial Corp.
Southern Electric Supply Co.
Sturtevant Co., B. F.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

**MOVING PICTURE MCH. AND SUPPLIES.**
(See Theatre Equipment.)

**NAPPER CLOTHING.**
Howard Bros. Mfg. Co.

**NAPPER ROLL GRINDING MACHINES.**
(See Card Grinders.)

**MUSICAL INSTRUMENTS.**
Cable Piano Co.
Conn, Ltd., C. G.

**NEEDLES—KNITTING.**
Torrington Co.

**OFFICE EQUIPMENT & SUPPLIES.**
Atlanta Stamp & Stencil Wks.
Dixie Seal & Stamp Co.
Jacobs & Co.
Knapp Fence Co.
Lupton's Sons Co., David
Monroe Calculating Mch. Co.
Royal Metal Mfg. Co.
Smith & Bros. Typewriter Co.
Sanymetal Products Co.

**OFFICE PARTITIONS.**
(See Partitions.)

**OIL—LUBRICATING.**
Johnson & Co., Inc., Oliver.
Lamson Oil Co., Inc.
Texas Co.
Wadsworth, Howland & Co., Inc.

**OIL ENGINES.**
(See Engines Oil.)

**OILS—FINISHING.**
(See Finishing and Sizing Materials.)

**OIL CUPS.**
(See Lubricators.)

**OIL PAPER.**
Bradley Mfg. Co., A. J.

**OIL SEPARATORS.**
(See Separators.)

**OILING DEVICES.**
(See Lubricators.)

**OPENING MACHINERY—COTTON, WOOL, WASTE, ETC.**
Murray Company, The.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

**OVERHEAD CARRIERS.**
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.
Euclid Crane & Hoist Co.
Wagner Mfg. Co.

**OXIDIZING MACHINERY.**
Phila. Drying Machinery Co.

**OXYGEN.**
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

**PACKING BOXES AND CASES—WOODEN.**
Lewis Co., G. B.

**PACKINGS.**
Jenkins Bros.

**PAINT.**
American Cement Paint Co.
Barrett Co., The.
Detroit Graphite Co.
DeVilbiss Mfg. Co.
Dixon Crucible Co., Jos.
Hockaday Co.
Johnson & Co., Oliver.
St. Louis Surfacer & Paint Co.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

**PAINT SPRAYING EQUIPMENT.**
DeVilbiss Mfg. Co.

**PAINTING CONTRACTORS.**
(See Contractors.)

**PANEL BOARDS.**
(See Switchboards.)

**PAPER.**
Bradley Mfg. Co., A. J.

**PARTITIONS—STEEL AND WIRE.**
American Fence Const. Co.
Dowman, George.
Dowman-Dozier Mfg. Co.
Anchor Post Iron Works.
Knapp Fence Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

**PERBORATE OF SODA.**
Roessler & Hasslacher Chemical Co.

**PERFORATED METAL.**
(See Screens and Sieves.)

**PEROXIDES.**
Roessler & Hasslacher Chemical Co.

**PICK COUNTERS.**
(See Counters.)

**PICKERS—CURLED HAIR.**
Proctor & Schwartz, Inc.
Schofield Co., Wm.

**PICKERS—LEATHER.**
Bond Co., Chas.
Garland Mfg. Co.
Jacobs Mfg. Co., E. H.

**PICKER LOOPS.**
Jacobs Mfg. Co., E. H.

**PICKER STICKS.**
Garland Mfg. Co.

**PICKING MACHINERY.**
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Proctor & Schwartz, Inc.
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Schofield Co., Wm.
Whitin Machine Works.

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General Electric Co.

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Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walker Electric & Plbg. Co.

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**PIPING—COTTON.**
Youngstown Sheet & Tube Co.

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Walker Electric & Plbg. Co.

**PIPE BENDING.**
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Rundle-Spence Mfg. Co.
Taylor, Halsey W.

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Sturtevant Co., B. F.

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Curtis Pneumatic Mchry. Co.

**PORCELAIN GUIDES.**
Mitchell-Bissell Co.

**PORTABLE CONVEYORS.**
(See Conveyors.)

**POSTS—FENCE (WOOD.)**
Southern Wood Preserving Co.

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Georgia Ry. & Power Co.
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General Electric Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.
Rhoads & Sons, J. E.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.

**PRESERVATIVE PAINT FOR METAL WORK.**
(See Paints.)

**PRESSED STEEL.**
Lupton's Sons Co., David.

**PRESSES.**
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Logemann Bros. Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Rex Eng'g Corp.
Textile Finishing Machinery Co., The.

**PRESSURE GAUGES.**
(See Gauges.)

**PRESSURE REGULATORS.**
(See Regulators—Pressure.)

**PRINTERS (CLOTH).**
(See Dyers.)

**PRINTING.**
Jacobs & Co.
Showalter Printing Co., A. J.

**PRINTING EXTRACTORS—HYDRO.**
Tolhurst Machine Works.

**PROPELLER FANS.**
(See Blowers.)

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Bristol Co.

**PULLEYS.**
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Link-Belt Company.
Mason, Volney W.
Renold, Inc., Hans.

**PULLEY COVERING.**
Williams & Sons, I. B.

**PUMPS.**
Allis-Chalmers Mfg. Co.
Goulds Mfg. Co.
Sydnor Pump & Well Co., Inc.
Toomey, Frank.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

**PUMPS—OIL.**
Lunkenheimer Co.

**PUMP VALVES.**
(See Valve Discs.)

**PYROMETERS.**
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Taylor Instrument Co.

**QUILLS.**
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**QUILL CLEANING MACHINES.**
Terrell Machine Co.

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A. & W. P. Ry.
Central of Ga. Ry.
Georgia Railroad.
Southern Railway System.

**RAW STOCK DRYING SYSTEMS.**
Brandwood, John.

**RECEPTACLES—FIBRE.**
(See Fibre Products.)

**RECLOTHING TOP FLATS.**
Howard Bros. Mfg. Co.

**RECORDING INSTRUMENTS.**
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Durant Mfg. Co.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

**REEDS.**
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Emmons Loom Harness Co.
Hayes Loom Reed & Harness Co.

**REELS.**
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Draper Corporation.
Gallaudet Aircraft Corporation.
Hunt Machine Co., Rodney.
Mossberg Pressed Steel Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

**REFLECTORS—LAMPS.**
(See Lamp Reflectors.)

**REGULATORS—LIQUID LEVEL.**
Foxboro Co., Inc.
General Electric Co.

**REGULATORS—PRESSURE.**
Bristol Co.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

**REGULATORS—TEMPERATURE.**
(See Temperature Controllers.)

**REINFORCING SLAG.**
Birmingham Slag Co.

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Curtis, Paul W.
Southern Electrical Supply Co.
Huntington & Guerry, Inc.
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General Machine Works.
Southern Spindle & Flyer Co.
Standard Gas Products Co.

**RESTAURANT EQUIPMENT.**
Sanymetal Products Co.

**RIBBERS.**
(See Knitting Machinery.)

**RIB TOP CUTTERS.**
General Machine Works.
Wildman Mfg. Co.

**RING TRAVELERS—STEEL AND BRONZE.**
Whitinsville Spinning Ring Co.
Whitin Machine Works.

**RINGS—SPINNING.**
(See Spinning Rings.)

**ROCKER SHAFT BEARINGS.**
(See Bearings.)

**ROLLS—CALENDER.**
Butterworth & Sons Co., H. W.
Textile Finishing Mchy. Co.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

**ROLLS—RUBBER COVERED.**
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Textile Finishing Mchy. Co.
Washburn & Sons, L. R.

**ROLLS—STEEL.**
Butterworth & Sons Co., H. W.
Southern Spindle & Flyer Co.
Textile Finishing Mchy. Co.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

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Dowman-Dozier Mfg. Co.
Richardson Co.
Southern Wood Preserving Co.
Wardsworth, Howland & Co.

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Barrett & Co.
Detroit Graphite Co.
Hockaday Co.
Johnson & Co., Inc., Oliver.
Wardsworth, Howland & Co
Ware Paint Co.

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Allis-Chalmers Mfg. Co.
Cresson-Morris Co.
Link-Belt Company.

**ROVING CANS.**
(See Cans—Roving.)

**ROVING MACHINERY.**
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

**RUBBER STAMPS.**
(See Stamps, Stencils, Etc.)

**SALTS.**
(See Finishing & Sizing Materials.)

**SANITARY PRODUCTS**
Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Sanymetal Products Co.
Taylor, Halsey W.
Vogel Co., Jos. A.
Walker Electric & Plbg. Co.

**SASH-WINDOW—STEEL.**
(See Window Sash.)

**SAXOPHONES, ETC.**
(See Musical Instruments.)

**SCALE PREVENTER—BOILER.**
(See Boiler Feed Water Purification.)

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Southern Theatre Equip. Co.

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Allis-Chalmers Mfg. Co.
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Link-Belt Company.

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(See Washers—Cloth.)

**SCRUBBING MACHINE—FLOOR.**
American Scrubbing Equip. Co.

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Mathieson Alkali Works.
India Alkali Works.
Warren Soap Mfg. Co.

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Whitin Machine Works.

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**SELVAGE HARNESS.**
(See Harness.)

**SEWING MACHINES.**
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*Edmund E. Hills,*
President.
E. E. H/N

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One No. 5—also Two No. 10 Whip Hoists
Shawsheen Mills, Shawsheen, Mass.
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New York Dock Co., Brooklyn, N. Y.
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Fig. 1021 "Ferrenewo" Iron Body Globe Valve

Fig. 73 "Renewo" Bronze Globe Valve

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The Iron Body "Ferrenewo" for low pressures and the Bronze "Renewo" for high pressures enables standardization of these Valves throughout the plant with ECONOMY and SERVICE assured,—economy, in that maintenance and upkeep is reduced to the minimum, and prolonged satisfactory service, because of proved correct design, high grade materials and workmanship.

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102-26-10

Fig. 863 "Renewo" Bronze Horizontal Check Valve

Fig. 996 "Ferrenewo" Iron Body Horizontal Check Valve

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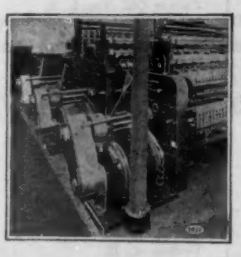

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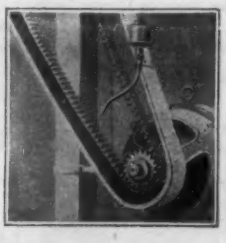



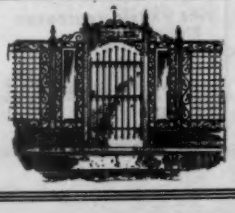

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Skayef Ball Bearing Co.
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Lupton's Sons Co., David.
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Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

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Barrett Co.
Dowman, George.
Dowman-Dozier Mfg. Co.

**SHINGLES—METAL.**
Cortright Metal Roofing Co.
Dowman, George.
Dowman-Dozier Mfg. Co.

**SHINGLES—WOOD.**
Southern Cypress Mfg. Assn.
Southern Wood Preserving Co.

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Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Collins, J. D.
Dixie Seal & Stamp Co.
Hightower Box & Tank Co.
Royal Metal Mfg. Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.

**SHOWER BATHS AND CABINETS.**
Crane Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

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Crompton & Knowles Loom
Draper Corporation.
Jordan Mfg. Co.
Shambow Shuttle Co.
U. S. Bobbin & Shuttle Co.
Williams Co., J. H.

**SINGEING MACHINERY.**
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

**SITES FOR FACTORIES.**
(See Industrial Sites.)

**SIZE BOX TEMPERATURE CONTROLLER.**
Bristol Co.
Foxboro Co.

**SIZE KETTLES AND TANKS.**
(See Bleaching Kiers or Tanks.)

**SIZING AND FINISHING COMPOUNDS.**
(See Finishing and Sizing Materials.)

**SKEWERS.**
Jordan Mfg. Co.

**SKYLIGHTS.**
Dowman, George.
Dowman-Dozier Mfg. Co.
Lupton's Sons Co., David.

**SLAG FOR CONCRETE.**
Birmingham Slag Co.

**SLASHERS AND SLASHER ROOM SUPPLIES.**
Butterworth & Sons Co., H. W.
Cole Mfg. Co. R. D.
Howard & Bullough
Mossberg Pressed Steel Corp.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

**SLASHER CLOTH.**
Philadelphia Felt Co.

**SLASHER HOODS.**
Cole Mfg. Co., R. D.

**SLASHER TAPE.**
(See Tape—Slasher.)

**SLATE ASPHALT ROOFING.**
Barrett Co.

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Dowman, George.
Dowman-Dozier Mfg. Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.

**SLUBBERS.**
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Saco-Lowell Shops.
Whitin Machine Works.

**SMOKE STACKS.**
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Dowman-Dozier Mfg. Co.
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Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
India Alkali Works.
Kali Mfg. Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Rohm & Haas Co.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

**SODA—TEXTILE, SODA ASH AND BOILING.**
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Sonneborn Sons, Inc., L.

**SOFTENERS—COTTON.**
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Bosson & Lane.
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Ciba Co., Inc.
Ford Co., J. B.
Grasselli Chemical Co.
Kali Mfg. Co.
Lennig & Co., Chas.
Roessler & Hasslacher Chemical Co.
Rohm & Haas Co.
Stein, Hall & Co.
United Chemical Prod. Corp.
Wolf & Co., Jacques.

**SOFTENERS—WATER.**
(See Water Softeners.)

**SOLDERLESS CONNECTORS—FRANKEL.**
Westinghouse Elec. & Mfg. Co.

**SOLOZONE.**
Roessler & Hasslacher Chem. Co.

**SOLVENTS.**
(See Finishing.)

**SPEEDERS.**
Jordan Mfg. Co.
Parker & Co., Walter L.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

**SPEEDOMETERS.**
(See Counters.)

**SPINDLES.**
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Vermont Spool & Bobbin Co.
Whitin Machine Works.

**SPINNERS.**
(See Yarn Manufacturers.)
Myrtle Mills, Inc.
Philadelphia Felt Co.
Parkdale Mills, Inc.
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**SPINNING FRAMES.**
American Machine Co., H. & B.
Crompton & Knowles Loom Works.
Howard & Bullough.
Schaum & Uhlinger.
Saco-Lowell Shops.
Whitin Machine Works.

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Draper Corporation.
Howard & Bullough.
Greist Mfg. Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

**SPINNING TAPE SPECIALISTS.**
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Whitin Machine Works.
Warp Compressing Mch. Co.

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Lestershire Spool & Mfg. Co.
Mossberg Pressed Steel Corp.
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U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

**SPRINKLER SYSTEMS.**
American Moistening Co.

**SPRINKLER TANKS.**
(See Tanks, Towers, Etc.)

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Link-Belt Company.
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Renold, Inc., Hans.

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Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Dixie Seal & Stamp Co.

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(See Tanks.)

**STARCH AND GUMS.**
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Bosson & Lane.
Ciba Co.
Corn Products Refining Co.
Kali Mfg. Co.
Keever Starch Co.
Mathieson Alkali Works, Inc.
Metz Co., H. A.
Pennick & Ford, Ltd.
Staley Co., A. E.
Stein, Hall & Co.
Warren Soap Co.

**STEAM ENGINES.**
(See Engines—Steam.)

**STEAM HOSE.**
(See Hose—Fire.)

**STEAM PUMPS.**
(See Pumps—Steam.)

**STEAM SEPARATORS.**
(See Separators.)

**STEAM TRAPS.**
(See Traps—Steam.)

**STEEL SASH.**
(See Sash—Steel.)

**STEEL SHELVING, DOORS, WINDOW PARTITIONS, ETC.**
Bogart & Carlough.
Dowman, George.
Dowman-Dozier Mfg. Co.
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Lupton & Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.
Truscon Steel Co.

**STEELS (STRUCTURAL).**
Dowman, George.
Bogart & Carlough.

**STENCILS AND STENCIL PAPERS.**
(See Stamps and Stencils.)

**STENCIL BRUSHES.**
(See Marking Pots and Brushes.)

**STENCIL CUTTING MACHINES.**
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Bradley Mfg. Co., A. J.
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(See Picker Sticks.)

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(See Furniture—Mill.)

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Silberberg, Mortimer J.

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Eclipse Textile Devices, Inc.
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Wildman Mfg. Co.

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(See Shelving.)

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Bond & Co., Chas.
Hayes Loom Harness & Reed Co.
Jacobs Mfg. Co., E. H.
Garland Mfg. Co.

**STRAPPING.**
(See Leather Specialties or Check Straps.)

**STREET LIGHTING FIXTURES.**
Cutter Works, George.

**SULPHIDES.**
(See Finishing & Sizing Materials.)

**SULPHUROUS ACID GENERATOR.**
Macomb Machine Co.

**SWINGS (PLAYGROUND).**
(See Playground Equipment.)

**SUPPLIES—GENERAL MILL.**
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Link-Belt Co.
Lunkenheimer Co.
Morse Chain Co.
Nashville Industrial Corp.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

**SUPPLIES (OFFICE).**
(See Office Equipment.)

**SWITCHES—KNIFE-ELECTRIC.**
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

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Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

**SYSTEMS (BUSINESS.)**
Ernst & Ernst.

**TABLES—MILL.**
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

**TACHOMETER (RECORDING).**
Bristol Co.
Root Co.

**TALLOW.**
(See Finishing Machinery.)

**TANKS—OIL, GASOLINE, PAINT, ETC.**
Bowser & Co., S. F.

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Godfrey Conveyor Co.
Lombard Iron Works.
Walsh & Weidner Boiler Co.
Woolford Wood Tank Co., G.

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Lombard Iron Works.
Woolford Wood Tank Co., G.

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Cole Mfg. Co., R. D.
Godfrey Conveyor Co.
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Textile Finishing Mchry. Co.
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# Power Transmission Economy Based On 33 Years Of Experience

For 33 years the fundamental principles of Hyatt line shaft roller bearings have not been changed but continual improvements in design and construction have kept them at the highest peak of practical efficiency.

The principles that make Hyatt line shaft bearings economical and dependable are:

Full support of load on long, strong rollers of high grade steel, that do not require adjustment or replacement throughout the life of the plant. Bearings roll easily on shaft, no fussy inner races, collars or adapters needed.

True rolling motion which effects a saving of at least 15% of the total power cost.

Positive self oiling action produced by the helical slots in the rollers which constantly lubricate all bearing surfaces. Replenishment needed only 3 or 4 times a year, an 85% saving in lubrication costs.

Being split throughout Hyatt boxes can be applied to existing line shafts without taking down shafts or disturbing frames, pulleys, couplings or collars.

Secure line shaft economy and dependability for your plant by installing Hyatt line shaft roller bearings with 33 years of experience built into them.

*"Phone the nearest mill supply dealer*

## Hyatt Roller Bearing Company

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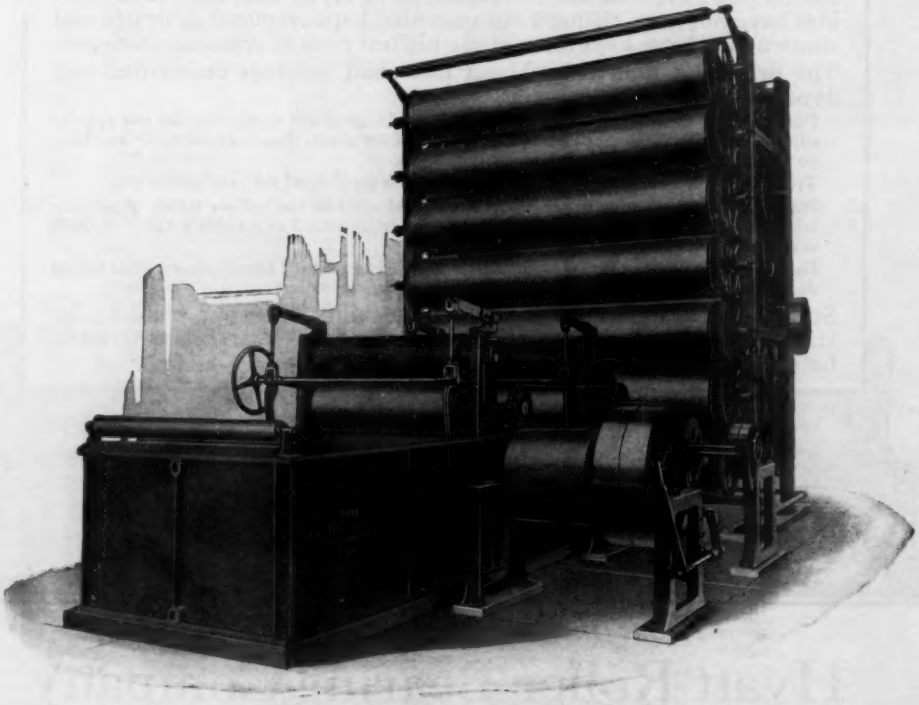


Warp Washer and Dryer

# Hyatt Bearing Spinning and Twister Frames Being Specified In Ever Increasing Numbers

**The 40 new Hyatt roller bearing equipped heavy twisters recently installed by The Ninigret Company, Pawtucket, R. I., are part of over 800 Hyatt equipped spinning frames and twisters now operating in progressive mills throughout the country. Many more Hyatt equipped frames are being built at the present time.**

The advantages offered are: Power Saving, Smoother Operation, Oil Saving and Durability

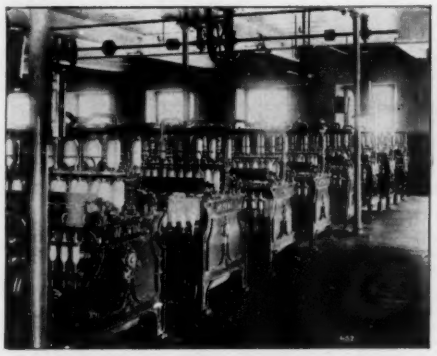
*Power Saving*—Carefully conducted tests under practical operating conditions in several mills have proved that Hyatt bearings save more than ½ H. P. per frame.

*Some of the 40 Hyatt bearing heavy twisters at Ninigret Company, Pawtucket, R. I.*

At a power cost of $30.00 per H. P. per year, this amounts to a saving of $15.90 per year per frame.

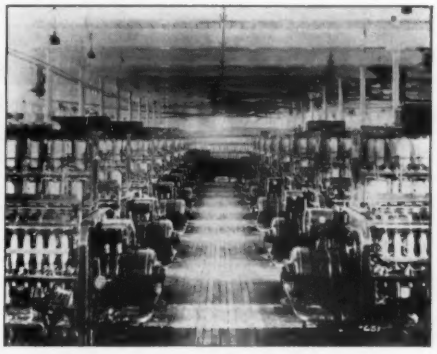
*Smoother Operation*—Due to the true rolling motion of the Hyatt bearings a smoother running cylinder shaft results, producing a more uniform spindle speed—more uniformly spun yarn.

*Oil Saving*—The usual practice in oiling Hyatt bearings is 4 times a year instead of the weekly oiling required by plain bearings—a saving of more than 90% in oil and the labor to apply it.



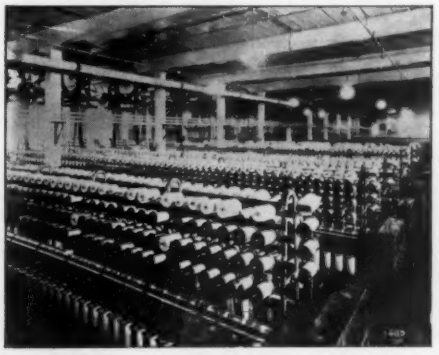
*Tecumseh Mills, Fall River, Mass., are operating 18 Hyatt equipped spinning frames.*

*Durability*—Hyatt bearings by reason of their almost frictionless operation and their chrome-vanadium steel rollers operate throughout the ordinary life of a machine without adjustment or replacement.



*18 Hyatt bearing spinning frames at Narragansett Mills, Fall River, Mass.*

Considering these important money saving advantages, can you longer afford to operate plain bearing frames, when you can have Hyatt bearings applied (six bearings) at an average cost per frame of $35.00?



*There are 40 Hyatt equipped heavy twisters in operation at Fairhaven Mills, New Bedford, Mass.*

Include this important item in your frame specifications or write us for more complete information.

*P. S.* Use Hyatt bearings on your line shafts too—save power (15% at least) save oil, save maintenance. See Bulletin 127.

HYATT ROLLER BEARING CO.

Newark Detroit Chicago San Francisco

Worcester Milwaukee Huntington Minneapolis

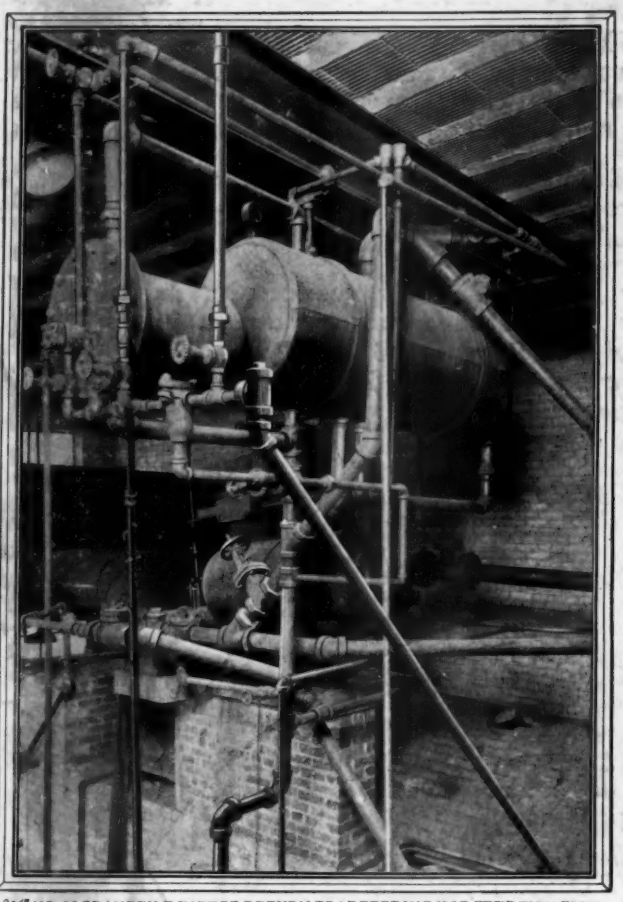
Philadelphia Cleveland Pittsburgh Buffalo Indianapolis

# *Saving the Energy in Hot Condensation*

There is no means known whereby condensation may be returned to a boiler if the condensation be at high temperature except by use of the Direct Return Trap.

The Cranetilt Direct Return Trap will deliver water into a boiler regardless of the pressure in the boiler or the temperature of the water.

Crane plumbing and heating equipment is built in types and sizes to meet any industrial requirement, and when properly installed will insure long life under the most severe conditions



2½" NO. 96 CRANETILT DIRECT RETURN TRAP FEEDING HOT CONDENSATION INTO A LARGE POWER BOILER AT THE EARL R. MALTBY CO., NORTH TONAWANDA, N. Y.

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